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THE NEED FOR STUTTERING[1]

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Everyone is impressed with the tenacity of stuttering. So strong is this impression that some authorities have questioned the possibility of ever entirely rehabilitating an adult stutterer's speech.

It is quite true that the stutterer does fight to retain his symptoms. And if his symptoms are reactions to danger, then according to his lights, he is right to do so. Of all the possibilities which he may recognize as being open to him, his stuttering appears to be the least evil. It provides him with some sort of a *modus operandi* which does work, however expensively. This being so, I doubt, even when it is possible, if it is always in the person's best interests to deprive him of his stuttering until the need for it has diminished or disappeared. To deprive him of his symptoms might be to plunge him into the very danger which he most dreads and which his stuttering was created to avert.

For example a physician referred a young man suffering from a generalized phobia and an agonizing anxiety. This state existed from the time he was deprived of his stuttering by a well-meaning but professionally naïve speech teacher. In removing the stuttering, the teacher had removed the stutterer's defense against a danger situation and he advertised his precarious condition in a completely disabling dread of all social contacts although he now spoke fluently. It appears then that a certain amount of judgment is needed about the advisability of taking a stutterer's symptoms of stuttering away from him. One must determine anew, in every case, what the stuttering means, what purpose it is serving. Perhaps now and then his stuttering is the best adjustment to reality of which he is capable.

[1]I am indebted to Dr. John M. Dorsey, Dr. Charles Tidd, Kenneth Artiss and Hope Chaney for constructive criticisms of this paper. I have purposely avoided making references to authorities in the body of the paper. May I acknowledge here my chief debt to Otto Fenichel and Karin Stephen.

Very often, however, this is certainly not true. He is capable of achieving a much better solution of his problems.

The thesis which will be advanced in this paper is that stuttering is a defense created with extraordinary skill and designed to prevent anxiety from developing when certain impulses of which the stutterer dares not become aware, threaten to expose themselves. In supporting this view, the crucial questions to be answered are: What are these impulses? How did they become dangerous? And why and how was stuttering developed to ward off the danger situation?

The first question may now be considered. Three great kinds of impulses with which we are all familiar are of love, hate and fear. And I am going to advance the proposition that stuttering is the expression of a conflict between either love or hate or both on the one hand and fear on the other.

To begin with, our early lives centered round the alimentary and respiratory experiences of feeding and excreting and breathing. If these activities failed we died. Therefore, keeping alive is their biological function. But, important both to medicine and psychology, is the fact that from the beginning, these activities have a value, not just for utility, but also for pleasure. One may actually reduce the driving forces of life to two, to live and to destroy. The need to live causes the organism to crave and seek nourishment and sense stimulation and the need to destroy causes it to avoid these. In health these two vital forces create no disturbance. The addition of pleasure and love to the biological functions makes them doubly worth while. As long as the pleasurable component is healthy, life is worth living and the bodily organs through which this component finds expression carry out their biological functions healthily. But when this pleasurable value is diseased, life loses its savor and the biological functions may show a parallel disturbance.

The physical basis of pleasure seeking is the special sensitivity of appropriate parts of the body. And these appropriate bodily parts are very extensive, particularly early in life. An important quality of the satisfaction of the pleasure component, whatever the bodily organs involved, is an overwhelmingness of the sense of being which can no longer be regulated or controlled. With this comes a great sense of power when there is no need to resist.

Sense-pleasure is therefore active. It really exists as a craving of certain parts of the body for stimulation leading to a discharge in some appropriate activity of the tension produced by the craving. This craving is from the beginning of life one of the most urgent needs of the organism and may it be stated at this point without further development here, that it meets with the most frequent and intense disappointment.

In addition to sense-pleasure being characterized as a craving, it has two other important attributes. One is that its essential satisfaction results in approach for purpose of communication. The significance of approach to the stimulus object is to permit further

stimulation by contact. The other attribute is that in mental health its expression, and very existence for that matter, depends upon the preservation and possession of the stimulus object.

Sense-pleasure underlies not only love in a narrow sense whose primary stimulus is gentle stroking but actually the capacity to care for anything—to invest it with attention and interest. On its successful growth and direction depend all concerted activity, constructive human relationships and essential interests of the person. When sense-pleasure is arrested or seriously impeded, certain acts in particular become halting and lame or disconcerted and the development of interest in other people and the whole outside world suffers. A fact that is not well known is that a stutterer treats objects and persons in the same way.

Although hatred is like sense-pleasure or love in that both involve approach to the object, the two are decidedly different in general pattern. Whereas love preserves and possesses, hatred destroys. Whereas love thrives on gentle stroking and fondling, hatred thrives on restraint and frustration of love. One is indicative of getting, the other of being denied. It must be observed that both involve intimate relationships with the object. Corporal punishment is as intimate and personal as an embrace.

Fear typically involves flight, flight from a dangerous situation. Whereas love is positive, fear is negative. Fear is to the mind what pain is to the body—a danger signal, an alarm.

For our consideration hatred and fear have another important characteristic. They prepare the organism for sustained and strong action in an emergency and as has been experimentally determined make it insensitive to pain. Originally they were of great adaptive value but later they have become distinctly disadvantageous.

So far in our discussion of these three primary impulses, to love, to hate and to fear, in terms of their direct responses of approach, destruction and retreat respectively, we have not mentioned the factor of symbolization in civilized man. Very frequently with us the approach, the attack and the flight are symbolic. Speech is action. Words take the place of stroking or blows or running away or weapons.

Our second question is, How did these impulses become dangerous? It has been postulated that stuttering is a defense designed to prevent anxiety from completely stilling the organism when certain impulses of which the stutterer dares not become aware threaten to expose themselves. We must now explain how these impulses came to constitute the danger situation.

As has been stated, the craving for sense stimulation is the most urgent need of the organism but it is one which meets with constant disappointment in our culture. This frustration produces a mounting up of undischarged tension which sets up a state of uneasiness and a feeling of restraint. Now the condition obtains for the reaction of rage which soon develops. The rage, if explosive, may do the required relieving and thus restore peace. This restoration is without any

resulting fondness for the outside object that caused the disappointment, since the wished for pleasure by means of it was not experienced. But if the tension is not relieved by pleasure or explosive rage it continues to mount until the organism is faced with an intolerable mental tension which is felt with anxiety. Through fear it may now be dealt with by repression in which sensual craving and rage are banished together from awareness. We must not let words frighten or confuse us. Repression means withdrawal of attention. Fear has become a part of the repressed material. Commonly fear follows upon the reactions of rage because the child may be afraid of the consequences of an attack. Thus there exists in the repressed material a mixed condition of sense craving, rage and fear. Here we have our alignment of forces. Sense craving and rage are pitted against fear and the three of them sent into exile and forcibly kept there by the the regulating activities of the organism. —F.

A most disturbing factor in our world is disappointment. Above all else it upsets the smooth functioning of sense-craving and consequently living and loving. According to what a child does, or better, is permitted to do about disappointment, he grows up healthy or ill. The pleasure-cravings of infant-hood and child-hood are relatively very intense. But since it is practically impossible even under most favorable circumstances in modern life to enjoy nothing but unbroken satisfaction, bitter disappointment is a consequence which every baby will have to handle almost from the beginning of its existence. Tragically, at this time the baby's power of tolerating tension is very feeble. Self-control as adults know it, is not within its power so that it has at its disposal three alternatives: despair, rage, and repression. The reaction of despair to disappointment is the supreme danger to the organism. It is emotional suicide and is to be avoided at all costs. Rage lays the child open to all the terrors that must beset any small creature which attempts to rear itself up against a huge and overpowering enemy. There is a further complication here too. A conflict develops between the rage at being disappointed and the already existing love for the object which disappointed the child. This is still further complicated by the fact that the baby is utterly dependent on the objects against which both rage and love are directed.

Repression evades but does not solve all of these difficulties. The infant avoids conscious displeasure and the immediate danger of the consequences of despair or rage by shutting off or turning away from the entire conflict just as it stands so that the whole emotional set—love, rage, fear—is excluded from awareness. In the long run, however, this turns out to be a bad solution because it provides inadequate discharge for the craving and so long as the conflict remains unresolved, the craving will go on although not now recognized and acknowledged as such by the child.

Normally the unavoidable repressions of early childhood are more or less resolved. Narrowly selfish wishes are gradually faced, acknowledged and renounced as bad bargains. But with the stutterer

the original disappointment is turned from and therefore never accepted so that the primitive demands of sense-craving are retained in their original form. He can not take any substitute for the original pleasures which were denied him. Time and experience do not touch or alter them. His early infantile wishes and hates and fears remain dynamic and force their way into expression as the symptoms of stuttering.

The tragedy is that the continuation of stuttering into adulthood is based on a mistake. Whatever may have been true in the past it is an error to suppose now that the stutterer cannot have something without destroying or swallowing it. But it is not an easy matter of convincing him of this error. He now possesses a craving born of long fasting and dreaming for impermissible things. And too, he has learned to take a pleasure, a secondary gain, in fasting and starvation. However, his objections to gaining fluent speech will be dispelled gradually if the possibility of real satisfaction for himself comes home at last.

Thus the danger situation arises from a misconception. An anxiety, the basis for all stuttering symptoms, is not based on a mature evaluation of realities but develops out of an infantile fantastic picture of the world carried over from an early time—a time when the stutterer's accepted realities were determined by immature, short-sighted wishes and when he was relatively helpless before the urgency of his own impulses. His fantastic world is full of impulses and terrors appropriate not to adults but to infants and young children. Having repressed these by fear they remain fearful and dangerous and when they threaten to expose themselves he develops first the anxiety with which they were put away. What he really fears and what stuttering was developed as a defense against, is the dreaded breakdown of control over the overwhelmingness of the pleasure impulses repressed. And so we have the need of stuttering.

But why did the child develop stuttering and not something else? That is our third question.

In general, stuttering is a symptom; it gives a disguised expression to repressed impulses in which both the repressed impulses and the repressing force may be recognized. It gives a peculiar kind of gratification, corresponding to the impulses which have been repressed. However, the stutterer, when he is stuttering, is trying to say just exactly what is not openly said and exactly what he thinks none of us wishes to hear. Stuttering may be painful, not only to the stutterer himself, but to those who have to see and hear him and may thus constitute an aggression against the listener. It is also just this truth which makes it difficult to discuss cases and causes many people to dislike and perhaps to reject a penetrating psychological study of stuttering.

Since most stuttering begins in early childhood the symptoms will have to be about infantile preoccupations no matter what the present-day age of the stutterer may be. A careful clinical analysis of stuttering will show that the symptoms consist of four main activities of

the so-called speech mechanism; retaining, expelling, ingesting and molding.

The retention activities are advertised in keeping the lips tightly together in attempting to form *p*, *b* or *m*; in keeping the tip of the tongue firmly pressed against the alveolar ridge in attempting to form *l*, *t* or *d*; in keeping the back of the tongue raised in attempting to form *g* or *k*; and in saying a sound or word or even a phrase, several times.

Expulsion activities are seen in sudden and sharp release of air resulting in hissing, in protruding the tongue, in pressing the tip of the tongue against the lower teeth and rolling the body of the tongue forward, in straining of the abdomen and in retching movements.

Ingestion is detected in attempting to speak on inspiration, and in sucking, biting, and chewing movements.

In molding activities the stutterer purses the lips, rolls his tongue as though forming a bolus, twists his face, and opens and closes his mouth without saying anything.

These symptoms reveal a mixed condition of sense-craving, rage and fear. The pleasure zones show displeasure as well as pleasure. The emotions displayed through them are hate as well as love, and stimulation of them may be resented as an insult and dreaded as a danger, as well as welcomed. The sitting up of this sort of self-contradiction in a vital physiological function as a result of thwarting is the earliest starting point of stuttering. Contradictory impulses are aroused simultaneously. The body behaves as if it were in conflict with itself and is trying to react in two contradictory ways at the same moment, such as inhaling and exhaling, opening and closing glottis, opening and closing mouth, raising and lowering tongue, and so on.

Stuttering is a compromise formation between seeking and inhibiting instinct gratification. It expresses part-success and part-failure for each of two conflicting interests or intentions. The stutterer wishes to express himself, and at the same time fears doing so.

This conflict focuses on two points; on words or sounds as symbols of objects, and on the manipulation of the speech organs forming these words or sounds. It is developed as follows: As has been noted in early life, sense-craving is expressed mainly in two activities, nursing and eliminating waste products. These two activities are served by zones particularly sensitized, the oral, the anal, and the urethral.

The oral activities of nursing and speaking are easily and strongly linked by virtue of the fact that they use exactly the same structures. Since speech uses pleasure-craving structures it has a powerful pleasurable component. It becomes mainly a love or an erotic act. From the beginning the communication value of speech is infinitely less than its pleasure value. The baby's first love object is the mother's breast or the nipple of a bottle. Its first love zones are its lips and mouth. By extremely close association in time and space,

sounds become the baby's second love object and speaking or more properly, babbling, a pleasurable activity like sucking itself. Now if there is mismanagement of nursing, particularly in relation to weaning, there is apt to be an associated disturbance in speaking. Speaking then suffers an empathic disturbance. Disappointment of weaning or the denial of the sense-craving of sucking may create a tension, a feeling of restraint. As we have seen this is the condition for anger or hate which may soon develop and the impulse to suck may turn into an impulse to bite or destroy. Here then we have a self-contradiction in the vital physiological function of nursing which may extend to its close associate, the function of speaking. The conflict between nursing and biting may result not only in a refusal to nurse, but also in a refusal to talk at all or in wanting to talk and not wanting to talk at the same time, namely stuttering. In this sense stuttering is equated with nursing-and-biting—the simultaneous arousal of contradictory impulses and we certainly see both activities advertised in stuttering actions.

Acts of elimination and acts of speech are associated because speech is also elimination. But they are connected too because both activities are pleasurable and satisfy the cravings of sense zones, although in this instance the sense zones are not identical as was the case with oral activities. In both the acts of elimination and speaking there is a "letting out" which holds the same pleasure for the organism. This idea is expressed in such words as diarrhea and logorrhea and in such phrases as "running off at the bowels" and "running off at the mouth." The disappointment of toilet training suffered by a child or the denial of the sense-craving realized in soiling introduces tensions and restraints leading to feelings of anger and hostility. The opposition exerted against wanton soiling may now be transferred against speaking, in the child's mind. As waste-products may be held back, now words will be held back. The self-contradiction in acts of elimination resulting in constipation or diarrhea may be displaced upwards to result in the self-contradiction in the speech mechanism to produce stuttering.

So far psychoanalytic work on stutterers reveals a preponderance of anal material suggestive of anal fixation of interest. There may be further regression to the earlier fixation of oral erotic activities. Normal speakers are either those who had no extreme conflicts and consequently no intense fixations at the early erotic phases of speech development or those who are experiencing these early cravings in some other way.

Excessive difficulty that stutterers experience in speaking before an audience is caused by the increased conflict between the competing impulses. The stutterer uses "others" to excite his needs and his inhibitions. There is all the more need not to reveal the banished impulses of sense-craving and hate and yet all the more need to say something. When alone he may speak better or perfectly because there is no one to see and to hear exactly what he does not want people to see and to hear and exactly what he thinks the people themselves

do not want to see and to hear. Consequently the conflict between the wish to speak and not to speak is weaker or practically absent, so that he may honor either wish, just as he chooses.

It has been said over and over again that the stutterer is socially morbid. It has not been said finally whether his social morbidity is the cause or the result of stuttering or both the cause and the result. Underlying social morbidity is self-consciousness and embarrassment in attempts at speaking. Now these states are present because in stuttering the individual is caught doing something that he doesn't want to be caught doing. Thus social morbidity becomes a guilt reaction in that the stutterer's sins are about to be found out. He becomes furtive, shy and literally hunted. He avoids people, and in crowds becomes non-committal in order not to give himself away.

It is clearer now perhaps what the stutterer is trying to accomplish by his symptoms. In the main he is treating words or sounds as objects of love and hate and manipulating his speech organs to express sense-craving and its denial. In turn, all this is done to relieve the tension from conflict, to gain partial satisfaction, but at the same time not to acknowledge to himself the true significance of the impulses thus partially released and satisfied.

By keeping his lips firmly closed for *p* or *b* or by prolonging a sound indefinitely he is making the sounds stimulus-objects to satisfy his own oral sense-cravings. He is not as much interested in tickling the listener's ears as in tickling his own first love zones. In molding activities the stutterer may be shaping his sounds or words into various masses.

So far psychoanalytical work has brought out little relationship between breathing action and stuttering although the well recognized connections between breathing and anxiety and breathing disturbances in stutterers point to such.

When the stutterer lets all the air out of his lungs before speaking or makes hissing sounds or sticks his tongue out he is symbolically eliminating waste-products or blowing us over or hissing or making faces at us. His repressed hostility as well as his repressed sense cravings is getting a disguised outlet. And he will stutter worse, even to the point of being unable to make a sound, in the presence of some prominent or authoritative person. This is true because parental figures are those against whom the stutterer's repressed aggressive and affectionate tendencies are the most intense and towards whom, because of incest barriers and fear of reprisal, there would be the most ambivalence.

We can see too why a person will stutter more on some sounds and words than on others. Certain sounds and sound-combinations are better love and hate objects, as well as inhibiting objects, than others, not only because of their phonetic but also because of their symbolic possibilities.

Many of us have noticed that a little child appears to enjoy his stuttering and that the frustration element is less apparent in it.

We say that this is so because he is never taunted by his little contemporaries who aren't bothered by the stuttering either. When he gets older the adults around him become exasperated, impatient, embarrassed and critical in relation to his manifestations and turn on him. So in a significant sense a stutterer learns of the shame and rejection of his stuttering from other people. If a little stutterer is symbolically nursing or eliminating or biting when he is stuttering, he is perfectly happy in doing so until he learns that he is doing something nasty and forbidden. At first it may be a joyous vocal enactment of childish naughtiness. But then comes the adult's reaction of intolerance and the child incorporates some extra burdensome layers of a foreign hostile adult attitude onto his own little tender growing "conscience." Rage, shame, and finally conflict take place and the occasional halting speech of the child turns into the violent stuttering of the adult. It may well be that if the little stutterer never encountered the harsh "conscience" of adults his stuttering would pass away, because of his own accord he would find other pleasures that would give more delight and other hates that would give more satisfaction. This may be why many pre-school children drop their stuttering. They absorb hardily their own little archaic sense-pleasures of their own free will. The one or two per cent who continue with stuttering have encountered such a frightening admonitory adult "conscience" that their little babyish sins freeze and linger on in a long and tortuous stuttering course.

What of the child who doesn't begin to stutter until nine or ten? For years he has had free and easy speech but one day he begins to hesitate, repeat and block. At last the force of the repressions has been broken. From an early day he carried his repressed complex of sense-craving, hate and fear well but finally because of illness or injury or continued piling up of bad management his restraining forces snapped and he fell into an anxiety. To relieve this he sought solace in stuttering. We are all familiar with the child who "begins" his bed-wetting at the age of nine or ten following the coming of a sibling.

The management of stuttering can take one of two courses. It can remove the need for stuttering and consequently the stuttering itself or it can augment the regulating and repressing forces of the organism so that the need cannot be felt.

To accomplish the first aim the stutterer must discover for himself the real nature of the impulses pressing for recognition. When he does, the need to disguise them in symptoms is eliminated and he cannot go on stuttering if he wants to. It is not enough for him to make a logical analysis of his difficulties. He has to feel and know and live the significance of his symptoms. To arrive at such a deep understanding he must be both able and willing to relinquish voluntary control and direction of his ideas and feelings in a thorough, day-by-day study of his personality structure. At long last the stutterer will gain normal speech by realizing the fantastic nature of his infantile longings and hates and fears and by incorporating them

in with the rest of experience, thus giving them perspective, allocating them in reality. He should not be made aware of why he is producing his symptoms before he is ready with a better way of solving his difficulties, lest his last state may be worse than his former. We are all familiar with magic cures that merely substitute one kind of symptom for another. Generally at any time subsequent to the development of stuttering, the stutterer is capable of accepting a better solution.

To realize the second aim the interest and attention of the stutterer are withdrawn from the expressions of the conflict and placed on a substitute performance. He is helped to shut out from awareness whatever tends to arouse the conflict so that a respite from intolerable tension is won by a kind of emotional blindness. In practice this is accomplished by giving the stutterer a substitute pattern, an objective attitude and relaxation exercises. When this method works it too frequently leaves the individual emotionally impoverished, full of protective reactions and lacking in flexibility. With very mild cases it does little else than further repress the unwanted material and accomplishes the end of making the individual apparently more socially acceptable.

The study of stuttering leads directly into other fascinating problems of speech. It goes so far as to intrigue us in regard to the origin of language itself. Would we be too rash in postulating that spoken language in particular arose and devoloped as a sublimation of infantile sense-cravings. Speech began as an autoerotic babbling, progressed through the magic level of influencing the environment by means of the vocal apparatus and finally ended up as a purposive means for the exchange of thought. All of this is a highly complex process which might represent the most important steps in the sublimation of our oral sense-cravings. Such conjecturing should give us new approaches to the problems of delayed speech development, sound malformations, voice defects and stagefright. We may go even further to wonder about the real significance of inhibition of thinking, uncertainty in making a definite statement, and flaws in logic.

Do not forget to attend the Convention at Pennsylvania State College September 2, 3 and 4, 1940, before your school starts— Why not make it a part of your vacation?

MEDICAL TREATMENT OF STUTTERING

Dr. F. Hogewind
The Hague

In the course of time opinion on the nature of stuttering has undergone many and various changes. Generally speaking it may be said that until the end of the last century the somatic theory was predominant, that is, it was thought that stuttering was due to some bodily defect—either local in the brain or the medulla oblongata; or that it was constitutional, hereditary or otherwise. It was never denied, however, that stuttering was associated with certain psychic phenomena; still, these were considered of secondary importance.

But since the beginning of the twentieth century the psychological theory has prevailed, that is, the symptoms are now supposed to be rather of purely mental origin. (School of Hoepfner-Froeschels.)

About one thing, however, opinion has always been unanimous, namely, that almost all stutterers suffer from nervousness. It remained an open question whether this nervousness was the result of the stuttering, or whether all stutterers were persons predisposed to nervousness; in which latter case the predisposition might have some share in the origin of stuttering.

Various modes of treatment were tried for the cure of this nervousness: isolation and rest, even rest in bed, psychical influence and suggestion, and even hypnosis, as well as medicines-sedatives, the chief being bromine and valerian. Only within the last ten years has the "nervousness" of stutterers really been systematically examined. Much light has been thrown on this subject, in particular by Szondy (Budapest) and Seemann and his pupils (Prague).

It is now generally admitted that stuttering is a form of neurosis. This, however, is rather a vague definition, for originally the term neurosis indicated those forms of nervousness for which no pathological or anatomical cause could be found. When later on an organic cause was found for any of them, they were eliminated, and the term functional was applied to those remaining.

Freund divides these functional affections as follows:

1. Those of a somatic or physical nature, based on quantitative effects in the function of the nerves (vegetative lability, increase of reflexes, etc.).
2. Those due to some particular mental cause.

The latter Freund terms genuine neuroses. In these personality, the Ego with its conflicts, plays an important part. But it is doubtful whether Freund's division can be accepted (Bumke).

Nadoleczny steers clear of the difficulty in his definition. He says: "Stuttering is a constitutional nervous disorder affecting the normal flow of words, and due to a number of physical and mental disturbances inextricably mixed."

Of course he thus assumes a constitutional predisposition to stutter in every case, and therefore indicates several grounds for it.

1. Most stutterers are genotypical vasoneurotics.
2. The proportion of stuttering of men to women is 3 : 1.
3. Heredity is more often found on the father's side than on the mother's.
4. 1000 stutterers had 214 stuttering and 2100 non-stuttering brothers and sisters. This shows that none but predisposed persons become stutterers by suggestion.
5. Many of these stutterers had been backward in speaking and had learnt with difficulty. This indicates some physical defect.
6. Lastly, we may add that the percentage of stutterers is practically constant, whereas other nervous disorders are much more often met with nowadays than formerly.

But what is the cause of this peculiar somatic predisposition?

Szondy made an exhaustive examination of 100 stutterers at Budapest and reached the following conclusions:

1. In families of stutterers a great many cases of epilepsy and migraine was found on the mother's side.
2. Epilepsy and migraine are found more frequently among stutterers themselves than among normal persons.
3. The size of the skull in stutterers varies greatly—up to 20% above and below the normal.
4. 20% of the stutterers show symptoms that clearly indicate brain lesions.
5. Most of the stutterers are genotypical vasoneurotics.

All these discoveries point to the definite conclusion that the central nervous system of stutterers is not quite normal; they have what may be termed a neuropathic constitution.

It occurred to Seemann (Prague) that this neuropathic constitution might also be one of the causes of stuttering. So he and his assistants (Sovak and others) examined the vegetative reflexes of 300 stutterers, namely,

a) the oculo-cardiac reflex as denoting of a possible vagotony;
b) the reflex of the solar plexus as denoting of a possible sympathicotonia.

By "oculo-cardiac reflex" we understand the lowering of the pulse rate caused by pressure upon the eye-ball, and by reflex of the solar plexus the weakening of the pulse caused by pressing on the solar plexus, a network of nerves at the pit of the stomach in the

neighbourhood of the spine, which forms part of the sympathetic nervous system. In 80% of the cases examined Seeman found a lability of the vegetative nervous system with extreme irritability of the sympathetic. This was found not only in adults, but also in children, and even in infants, in whom vagotony is a normal condition. Seemann considers himself justified in regarding this peculiar defect of the vegetative nervous system as of great importance in the etiology of stuttering. He thinks the explanation of how this lability may cause stuttering is to be found in the more recent discoveries by von Economo after the great influenza epidemic of 1918, with its numerous cases of encephalitis. For the inflammation affected the very parts of the brain whose functions at that time were mostly unknown. These were the central ganglia, which are situated in the di-encephalon, and comprise not only the already known thalamus opticus, but also the striatum, which again is subdivided into the older pallidum and the newer neo-striatum. These latter centres have motor functions (regulation and inhibition of the tone) and belong to what is known as the extra-pyramidal system, which adjoins the pyramidal system (the direct connective between the motor centres in the cortex and the muscles). The thalamus is the converging point for all sensory impressions, which are thence conveyed to the cortex. But impulses are also sent out from the cortex through the thalamus to the striatum. The neo-striatum again sends out motor nerve-fibres through the pallidum and the red nuclei near the medial plane along the extra-pyramidium to the muscles, including the lingual muscles.

The neo-striatum therefore has direct influence on the lingual muscles. It regulates the pallidum, inhibits and stimulates it. When this check is lacking (as in babies, in whom the pallidum functions but the neo-striatum does not), the action of the pallidum becomes uncontrolled, and the action of the muscles is therefore without co-ordination. (In this sense it may be said that a baby is "unregulated.")

Some pathological disturbances of the striatum are known. In St. Vitus's dance, for instance, a disease of the neo-striatum causes the well-known involuntary spasmodic movements, and sometimes it also affects the lingual muscles. If the neo-striatum is only slightly diseased it may cause "tic," involuntary spasmodic contractions in certain facial muscles connected with the lingual muscles and thus affecting speech. (Schilder regards both tic and stuttering as striatum neuroses.) For this reason Seemann inclines to the theory that strio-pallidal action accounts for the spasmodic symptoms in stuttering. This might be caused by:

1. A lesion, or some similar morbid change, in the striatum. This is unknown in stuttering.
2. The presence of a functional disorder due to reflex influences.

The latter is quite possible. The brain centres of the vegetative nervous system (also the seat of subconscious psychic emotions) lie

quite close to the central ganglia and are connected with them. This is seen in Parkinson's disease, a disorder marked by numerous sympathetic disturbances.

Now Seemann thinks that the action of the strio-pallidum is disturbed by psychic emotions along this line of connection with the upper vegetative centres. If such a reflex curve is disturbed by internal or external influences, the functioning of the extrapyramidal system is affected and causes repeated tonic, clonic, and joint movements in the region of the lingual muscles or in more distant groups of muscles. So Seemann looks upon the strio-pallidum as the organ responsible for the involuntary spasmodic movements connected with stuttering. This may well be the source of what Gutzmann terms "irritable weakness." But the nature of this "irritable weakness" must be regarded as something different from what it was formerly supposed to be, for only then can the disorders of the nervous system afford an explanation of "the nervous reactions in the lingual muscles" (Nadoleczny). This theory supports Froeschel's opinion that stuttering is of psychogenetic origin. Indeed some disturbance in the vegetative nervous system, especially one inclining to the sympathetic side, is invariably an accessory symptom in stutterers, even in little children who are naturally vagotonic, as Seemann, Szondy, and others, found in 80% of the cases they examined.

Szondy had already pointed out that there must be a relation between stuttering, epilepsy, and migraine. It is now known that epilepsy is accompanied by disturbances in the striopallidar system, while it is assumed that migraine is due to much the same causes as stuttering, a centre probably in the central ganglia and some disturbance in the vegetative nervous system, which may lower its power of reaction and thus bring on an attack of migraine.

There is another sort of relation between stuttering and two other disorders—vasomoter catarrh and allergic eczema. It is very curious that when a patient is suffering from these three disorders at the same time, as often happens, if the stuttering gets better the other two get worse, and vice versa. The vegetative nervous system has great influence on all these disorders. In view of this, attempts have of course been made to cure stuttering by medical treatment. Flatau and Jaensch, and later on Gutzmann Jr., treated defective speech in general and stuttering in particular according to the constitution of the patient. They especially took into consideration:

a) The form of the capillaries.

b) The psycholability.

For the first the persistence of rudimentary forms in the capillaries of the nail-bed (archi-capillaries and mesocapillaries) was conclusive. In Berlin archi-capillaries in particular are very often found in cases of defective speech. For adults with no capillary defect, Brosedan (a bromium preparation) was prescribed if they were suffering from psycholability, and Gynergen (an ergotine prep-

aration) if they had what Jaensch called "basedoids" (a form of sympathicotonia). When archi-capillaries were found, Lipatren (an "iodolipoid" combination) was given to patients of all ages. With spasmodic symptoms Calcium was also used, and for endocrinous disorders gland-preparations (especially hypophysin). Lessons in speaking were always given to the patients during the course of the treatment.

The results described by Flatau and Gutzmann were favourable.

Being impressed by the results of the investigations of Szondy and Seemann, I tried to find a preparation suitable for older stutterers, and I think I have discovered one in Bellergal (Sandoz). This consists of "Bellafoline" (vagal sedative), "Gynergen" (sympathetic sedative) and phenobarbital (sedative of the central part of the vegetative nervous system).

We began the experiments with older patients because the preparation is not absolutely harmless. We chose patients with undoubted disturbance of the vegetative nervous system together with increased tonus of the sympathetic. Lessons in speaking were given during the course of the treatment. We generally began by giving a large dose (3 or 4 tablets daily) for the first fortnight and gradually diminishing it. The treatment was also stopped for a short time now and then. On the whole the results were satisfactory, sometimes, even very good. The patients became calmer, and during the intervals, several asked of their own accord to be allowed to begin with the tablets again, so that they could speak better. As a test, and also to prevent possible suggestive influence, some of the patients were given Bellafoline tablets, containing only the vago-sedative component. This, however, had not the slightest influence on the speech, even when vagotony was undoubtedly present. The vagotonic symptoms were lessened, but the stuttering remained unchanged. When Bellergal was resumed its effect was again clearly apparent, even when the patient did not know that he had had a different medicine. By degrees we tried giving the preparation to younger patients, too, but in smaller doses. I have sometimes tried to cure stuttering in children under the age of twelve by means of Calcium (lime), especially in cases where symptoms of vasomotor catarrh, asthma, spasmophilia, noctambulism, etc., were also present. This treatment was also successful in several cases. The children became calmer and were able to speak more easily. But it is absolutely essential that the medical treatment is accompanied by lessons in speaking. For slight attacks during the first stage of the disorder treatment with Bellergal or Calcium alone may sometimes be successful, but it cannot be relied upon. Here, too, linguo-medical treatment is supreme.

Bellergal seems to be very effective in overcoming the serious difficulties so often encountered during the earliest stages of the treatment of older stutterers. It also reduces the duration and the gravity of the relapses. In view of these experiences, my opinion is

that we should not fail to apply medical therapy to cases of stuttering when possible, although I know that the last word on this subject has not yet been pronounced.

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BOOK REVIEW

HOW TO HELP YOUR HEARING. By LOUISE M. NEUSCHUTZ, with a Foreword by WALTER B. PITKIN. Harper Brothers, New York and London, 1940. 180 pp. $2.50.

The fly leaf states: "Here is a practical and encouraging guide to all upon whom deafness has come, showing them in detail how to cope with their condition by measures educational, mechanical, social and psychological."

In many ways this book is a unique contribution. The first chapter is one which frankly attempts to get the reader who may have been losing his or her hearing to face the fact unafraid and with a sensible understanding of what it all means. In other words, it is typical of the mental hygiene method of approach which is carried throughout the book. Indeed it is replete with sensible suggestions and sound advice which neither the medical doctor nor any other scientist can often disagree with.

THE NOMENCLATURE OF CERTAIN FORMS OF SIGMATISM

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It is only in fairly recent years that logopaedia has been fortunate enough to arouse the interest of the scientifically minded. A. Kussmaul and H. Gutzmann, Sr., who may be regarded as the founders of this new branch of science, wrote a standard work which was published in the years 1910 and 1912.

The "Kurzes Lehrbuch der Sprach-und Stimmheilkunde" by M. Nadoleczny appeared in 1926 and the third edition of E. Fröschels' "Lehrbuch der Sprachheilkunde" (Logopädie) dates from 1931.

It goes without saying that after a careful examination of hundreds of patients carried on over several decades, observation has been more and more reduced to a fine art. The more subtle distinctions which are now made have revealed the need for new names which were not previously called for, when. for instance, any stammering defect in the case of the letter "s" was termed a "lisp." One must, however, bear in mind that a name can only be considered to be apposite when it provides an "explanation" of the fact which it indicates.

A correctly chosen name will therefore not only prevent confusion but will assist conception. Some of the names given to the many forms of sigmatism are not, in my opinion, adequate for their purpose.

Sigmatisms get their name from the place of articulation of the faulty "s" or from the abnormal resonance when this happens to be the characteristic of the stammerer's "s" defect. When consulting the standard works quoted about the name "sigmatismus stridens," we find that the following meaning is given:

1. an "s" having a whistling sound, caused by the escaping breath being forced through a small channel which is too short and too narrow, and which is formed too far towards the front of the mouth;
2. an "s" which has the character of "sch" and which therefore has too heavy a sound because the channel is too long, too wide and formed too far back in the mouth.

For one of these cases a new name ought certainly to be introduced because it is illogical to give the same name to two abnormalities which, both from the point of view of articulation and acoustics, present so sharp a contrast. I should like to retain the name "stridens" for the "s" described under 1. The "s" described under 2 which, physiologically, is identical with the palate "s" described by L. Stein in "Sprach- und Stimmstörungen und ihre Behandlung in

der Praxis" (1937) I should like to call "sigm. palatalis" (In Dutch a palatal "s" only occurs as something abnormal.)

Sigmatismus stridens is usually found—and then generally as a passing phrase—in cases of hypercorrection: a. after the case of another "s" stammering defect; b. in persons who have to become accustomed to new articulation conditions, e. g., when prothesis is necessitated.

Sigm. stridens occasionally occurs as a defect of speech apart from these causes. People who speak in a certain affected manner usually emit a strident s.

If therefore sigm, stridens is the result of an individually too far forward basis of articulation, sigm. palatalis may be said to be the result of the contrary. Those who articulate too far to the back of the mouth will show a sigm. palatalis.

Sigmatismus stertens and Sigmatismus nasalis

In the literature on sigmatisms both these "s" defects are mentioned in one breath; both are considered to be the result of hyperrhinolalia and sigm. stertens as a more pronounced form of sigm. nasalis. If we carefully examine these two abnormalities, it is evident that, physiologically, they have hardly any similarity.

In sigm. stertens there is intentional articulation in the nasopharyngeal cavity causing a stertorous sound which can only be considered as an "s" from a phonological point of view.

If for instance the nasal cavity is closed by finger pressure, the stertorous sound is not heard.

In sigm. nasalis the "s" is formed in the correct place of articulation but is only heard faintly or not at all, because the function of the soft palate is eliminated. If now the nasal cavity is closed, a normal "s" is heard.

It is quite evident from this that the corrective measures must be different. In sigm. stertens the articulation of the consonant "s" has to be taught from the very beginning. In sigm. nasalis the soft palate has to be made to function, also when the "s" is pronounced. All these comparisons show that the nature of sigm. stertens and that of sigm. nasalis is quite different.

In the name sigm. stertens, "stertens" refers to the acoustic sensation. The name "sigm. nasopharyngealis" would indicate the faulty place of articulation. This name is in my opinion to be preferred to the other which draws too much attention to the nasal element which is here not of primary importance. The name sigm. nasalis I should like to retain for the other "s" defect where the too abundant nasal sound is usually the remnant of a general hyperrhinolalia.

Finally, I should like to refer to a rarely occurring case where in sigm. nasalis no normal "s" is heard when the nasal cavity is closed. In such a case, apart from the insufficient functioning of the soft palate, there exists evidently another articulation defect in addition, which should be first corrected.

THE EFFECT OF DISTURBANCES IN THE DEVELOPMENTAL PROCESSES UPON EMERGENT SPECIFICITY OF FUNCTION[1]

MARY H. MEADER, Sc.D.

I. Hyphoid Speech

The emergence of specificity of function in the living organism depends upon the spacio-temporal frame of growth, within which the events of the growth period are integrated. Every new emergence is an outgrowth of the preceding dynamics of the organism. Consequently, any disturbance in the normal equilibrium of growth will produce a specific effect upon those tissues immediately involved, and a consequential effect upon later emergences—both structurally and functionally. Thus, for example, deprivation of thiamin chloride (vitamin B-1) during the early months of gestation interferes with the developing nervous system, retarding and altering its emerging structuro-functional pattern, and results, among other things, in an inferior intelligence.

It is theoretically possible, and to a large extent practicable, to determine from the specific failures and anomalies in behavior the type of disruption and the period during the earlier stages of growth at which the disturbance occurred. This principle, manifest throughout the entire field of embryology, may be fruitfully applied to the diagnosis and therapy of various speech disorders and to the motor, emotional and ideational behavior of the child as well.

It must be borne constantly in mind that speech is a highly specialized form of behavior, involving not only the so-called speech organs but also the entire functional organism, and that speech processes are inseparable, both developmentally and functionally, from the total dynamics of behavior. Speech in itself is merely a specific focus of the dynamic functioning of the individual. For this reason, it is probable that speech deviations and anomalies are never found alone, but, rather, are associated with other disorganizations and anomalies of behavior, involving, of course, disordered physiological processes.

In a study of 150 institutionalized, (1) mentally retarded children between seven and thirteen years of age, the group as a whole was found to be consistently inferior, both physically and physiologically,

[1]Paper delivered before the A. A. S. C. A., December 28, 1939.

to the normal population, and much more heavily marked by pathology. A definite positive correlation existed between the degree of deficiency as measured by the I. Q. and the degree of deviation from the normal (average population) in physical and physiological standards. These results are even more striking when compared with Terman's (2) findings in children of superior mentality (I. Q. 140 and over). See table. Speech deficiency of the hyphoid type was present in some degree in one third of my cases, while the histories indicated that probably most of the more seriously retarded had

TABLE I

COMPARISON OF MEDICAL FINDINGS IN GENIUS AND MENTALLY RETARDED CHILDREN

		My Group	
	Terman's Group	I. Q. 67 and Over	66 or Less
Speech defects	2% stutter 0% other	Speech cases excluded from	
Delayed walking	3%	17%	52%
Mouth breathing	2%	5%	12%
Delayed speech	1%	25%	44%
Diminished vision	23%	41%	48%
Strabismus	2% (less than)	19%	18%
Discharge ears	"almost none"	15%	5%
Genital defects	"very rare"	21%	22%
Endocrine dyscrasia	occas. hyperthyroid	Very high (see text)	
Dental cavities	60%	97%	97%
Average number cavities	1	5	3.3
Poor health of mother during pregnancy	7.8%	46% or more	52%
Premature, 8 mos. plus	8		
8 mo. or less	2.7%	4%	14%
Convulsions	2%	15%	20%

Terman's figures for measles, whooping cough, chicken pox and mumps are somewhat higher than mine, possibly because of more complete histories or because my cases were not exposed after institutionalization. Scarlet fever and pneumonia are about four times as frequent in my group. Syphilis, epilepsy, and tuberculosis did not occur at all in Terman's group, and less than 0.2% of chorea. These more disastrous diseases are common in the retarded groups.

The differences between the higher and lower levels of the retarded group would be even more striking if, instead of the arbitrary division at 66 I. Q., what appears to be a *critical point* at about I. Q. 58 were used.

shown this syndrome at an earlier age. There exists a common etiological basis for hyphoid speech and a very common type of mental deficiency. The histories confirmed unusually severe gestational disturbances. Presumptive evidence of at least sub-clinical endocrine dysfunction was present in 60%. The differential blood counts exhibited marked deviations from the normal, especially in the lower group of I. Q.s. Basophilic increase, moderate and pronounced lymphocytosis and some degree of anemia were typical findings. There was a definite group tendency to arterial hypotonicity, itself commonly a symptom of endocrine dysfunction.

As a result of clinical studies and research, I have recognized a new deficiency syndrome which I have termed *hyphoid speech*, partially explained its etiology and developed a rationale of therapy. Hyphoid speech may be regarded as a symptom of generally retarded development, resulting from serious deviations from the normal developmental process during the first few months of gestation. Evidence of prenatal rickets, arterial hypotonicity, some degree of secondary anemia (R. B. C. low, in later stages the color index is often high), hypothyroidism (not cretinism) and probably also some degree of pituitary, suprarenal and other glandular involvements, are characteristic findings in these cases. The general motor development is retarded and the mentality is usually also retarded (not necessarily genetically inferior, however). All the speech levels are affected: melody, rhythm, accent and phonation, as well as articulation and the rhythmic integration of syllables in sequence. The speech is choppy, the output is in the form of brief, explosive bursts involving single hyphae. It is from this, the most striking characteristic of the speech that the name *hyphoid* is derived. (The hypha, identified and described in the research of J. H. Muyskens, is the smallest physiological unit of speech; it consists of a series of movements bounded initially by a dilatation of the vocal tube, bounded terminally by an occlusion or constriction of the tube, with, usually, an intervening tetanic contraction. The single syllable usually, but not always, consists of a single hypha.) In these cases there is always a history of delayed onset of speech, frequently as late as the sixth year. This syndrome may be confused with so-called baby talk which it superficially resembles, but from which it may be clearly distinguished by the characteristic form, especially by the complete absence of smooth transition between the series of muscle movements, such as exists in normal speech, which results in the typically explosive and disrupted character of the speech.

The hyphoid character of the speech appears to derive from the generally low energy of the entire organism, resulting in the necessity for a disproportionate release of energy, increased tetanic contraction of the muscle groups and heightened tonus of the tissues involved in phonation and articulation in order to accomplish the complex function of simultaneous vibration of the vocal folds and the modified vegetative reflexes of articulation. Consequently, the speech is explosive and the available energy is exhausted within the limits of the hyphae, necessitating a complete break between each accomplished articulation. Speech, due to the environmental stimuli, and the development of cortical pathways, begins before an adequate basis in melody, rhythm, accent and the vegetative reflexes has been established. (3) (This basis is normally built up in large part by the end of the first year of life, before speech proper emerges.)

In all cases of hyphoid speech a thorough medical examination should be made and every effort exerted to correct the nutritional, endocrine and other deficiencies. Speech training is very important and if properly carried out, remarkably successful. In one case in

our experience a boy of sixteen, whose speech, typically hyphoid, was quite unintelligible, was taught to talk adequately and well in less than six months. Speech training must be begun at the lowest level of speech emergence. This point is of the utmost importance and upon it depends almost entirely the success of the therapy. Training in simple phonation and melodic variation should be undertaken. The vegetative reflexes of swallowing, sucking, blowing and chewing should be carefully built up. Rhythmic repetition of simple hyphae (such as *bah*) should then be practiced. These exercises and all the training in articulation should be carefully selected in conformity with the natural order of emergence. (See tables on the genesis of speech movements). Later rhythmic and melodic speech in rhyme, jingle and sentence form may be worked on, and this as well as the earlier exercises should be integrated with the movements of the large muscles of the body—clapping, foot tapping, marching, dancing, etc.—and, of course, with rhythmic breathing.

Whatever the hereditary endowment of the individual, however adequate cortical development, intelligence can be expressed only through speech and other motor processes and glandular secretions (such as tears). Furthermore, the intellectual potential can be developed, externalized and functionally integrated only through the experience which sensory stimuli, language and motor skills make possible. If a child lacks vitality because of poor nutrition, if his physiological processes are disordered through metabolic or endocrine disturbances, if he is unable to use properly the lips, jaws, tongue, etc., or is unable to manipulate objects due to the general retardation of motor development or myelinization of nerve fibers, or through specific toxic or mechanical trauma, then his speech cannot develop normally, and his mental development must also be retarded or damaged, often both directly through the original condition and indirectly as a result of the failure in the speech, sensory or motor processes. Ordinarily the language comprehension of such a child is relatively unimpaired, but where the original damage has been severe and extensive he may not develop normal language comprehension, as is the case with the congenitally deaf or partly deaf child and with the type of individual we term a kinaesthetic learner. In the latter case the comprehension of language, and, later, of written language also, appears to depend upon the integration of the kinaesthetic sensations of speech (phonation and articulation) with the auditory and associative neural pathways and not, as is usually the case, upon the auditory sensations primarily. (Other senses are, of course, involved also.)

Intelligence can only be measured through our observations of its various outer manifestations, which, in the event of linguistic and motor failure, are extremely limited of necessity. We should therefore be absolutely certain that deafness, visual and kinaesthetic impairment, aphasia or motor retardation, or even nutritional or metabolic disturbances are not in themselves sufficient to account for the actual or apparent mental retardation, in which case the

correction of these conditions through medical therapy and training will result in a normal emergence of the higher processes. This is true in the degree to which the physiological age of the child permits of further growth of intelligence, or where the inhibiting factor merely prevents the manifestation of developed intelligence. Intelligence in the last analysis must be regarded as a function of the entire organism, even though cortical development is a dominant factor in ideation. In many cases which I have observed sound native intelligence, occasionally even exceptional gifts or "genius" existed, awaiting only the removal of limiting conditions affecting the expression thereof. This is especially true in cases of extensive motor damage of the type which appears to be associated with toxemia of pregnancy, as well as birth traumas of various types. These children are only too often regarded as congenital imbeciles or severe mental deficients and nothing is done to make possible such development as may be potentially present. In part II of this paper I shall go into some detail as to various particular forms of inhibition of emergent specificity other than hyphoid speech, and in part III into the therapeutic measures and, especially, training techniques which have proven effective.

II. The Genesis of Speech

Embryological Development in Relation to Speech

Conception. The genetic constitution of the germ cells determines the hereditary potentialities of the organism. Although not completely understood, it is generally agreed that damage of the germ cells is responsible for certain anomalies and deficiencies in the organism.

Embryonic Period. This period is characterized by the rapid growth, proliferation and differentiation of tissues as integrated functional units. The structuro-functional basis for circulation, secretion (endocrine and exocrine), central and sympathetic nervous processes, etc., is established. Communication between the embryo and its environment and within its own organism, largely of the physico-chemical type, exists. Neuro-motor integrations, especially those involving the sympathetic system, are beginning to develop. The basis for *melody, rhythm* and *accent* is established in a considerable degree of complexity during this period. The basis for melody, determined by mechanical strains and nutritional and endocrine factors, is very nearly complete.

Fetal Period. By the end of the third month of gestation, the process of differentiation of tissues into the main structuro-functional systems is very nearly complete. Thereafter, development consists in increasing in size and weight and in the more delicate differentiation of tissues. Myelinization of nerves begins in the fifth month, of the cortex in the tenth; the complex integration of the nervous system proceeds rapidly. Reflexes of the large muscles of the body are

GENESIS OF SPEECH

PHONETIC

Age of Development	Basic Vegetative Movements	Specific Utterances	Type of Contraction	Predominant[1] Muscle Groups	Specific Motor Innervation	Notes
Within the first hour after birth	Tonus, tetanus, peristalsis, simple contraction; swallowing, sucking, chewing, valving of pharynx and larynx, yawning, gasping, coughing, etc.	Phonation, all vowels, most consonants	tetanus	all	V, VII, IX, X, XI, XII cranial; majority of spinal nerves	Generalized motor response to stimulus, primordial movements, not sharply differentiated; one blends into the other
4th to 7th months	swallowing	ŋ, g, k	simple contraction	tongue	XII, pharyngeal plexus	ŋ precedes g; g precedes k; m precedes n
	sucking, swallowing	m, n	tetanus	orbicularis oris, tongue	VII, XII	
([2])	sucking	b. p	simple contraction	orbicularis oris	VII	b precedes p.
	chewing, swallowing	d, t	simple contraction	tongue	XII	d precedes t
12 mos. to 3 yrs.	blowing, chewing	f, v, sh, ch, dʒ	tetanus	orbicularis oris, tongue	VII, XII	f and v earliest by several months
2–3 yrs.	sucking, lapping	l, r	tetanus	tongue	XII	high energy tetanus; l precedes r
2½–3½ yrs.	sucking and blowing	s, z	tetanus	tongue	XII	highest energy tetanus; s precedes z

[1]Breathing muscles are involved in all cases; also hearing from the first week.

[2]Apparent exceptions to this order of emergence are due to the varying rates of growth and specific refinement in different individuals. The voiced consonants of one group may develop before the voiceless consonant of the next earlier group.

	Age	Activity	Explanation
Training Undifferentiated Consciousness Reflex	prenatal	Expressive movements; largely kinaesthetic stimuli; some tactual stimuli (auditory, [liquid medium bone conduction], taste possible)	Mechanical and physiological, simple neuro-motor and secretory reflexes
	neo-natal	expressive cries and vocalization	Pain, discomfort, well-being, hunger, etc. Simple reflex
	1–3 wks.	expressive cries and vocalization	Conditioned reflex, well-being, hunger, etc., simple reflex (environment response to the child is an important conditioner, e. g., baby cries, is picked up, cries to be picked up), integration with social environment
	3–6 mos.	"Babble" syllables (hyphae)	Reflex
	4–7 mos.	"Babble" syllables (hyphae)	Conditioned reflex (stimulus-response)
	5–9 mos.	"Babble" syllables (hyphae)	Sensorium, cortex, consciousness involved; integration with social environment, "taught" or "learned" response, imitation
Education Conscious Learning	7–12 mos.	*Naming* "words" (noun=sentence), (differentiation between self and environment); "verbs" used as nouns	Conscious dynamics,—emergence of awareness of self vs. not-self (beginning of individualization) analysis Feeling of *Power* through *naming*
	9–18 mos.	*Action* words (*state* of object or self; passive vs. active not differentiated) sentence=noun and verb	Further development of above
	15 mos.–2½ yrs.	Modifiers (further analysis of environment)	Further development of conscious processes; integration with social environment; use values of speech an important determining force in development; environmental speech pattern a controlling factor

NOTE: Further extension and deterioration of vocabulary and of syntax goes on through life.

built up through fetal movements; respiratory movements take place (tonic contractions) from about the fifth month, and the sucking and swallowing reflexes are highly developed in-utero. Valving of the larynx presumably occurs. Neuro-glandular reflexes, complex sympathetic integrations, probably some sensory integrations, and possibly primitive conscious elements emerge during the latter months of gestation.

At the end of the fetal period the physico-physiological basis for speech has been developed as follows:

1. Melody, rhythm, and accent are considerably elaborated. (Nutritional pattern, endocrine balance, neuro-motor reflex patterns, etc.).

2. Phonation: tonic movements of the chest and diaphragm, basic to respiration, and development of basic glottal and pharyngeal reflexes as well as tonic contractions of the laryngeal musculature.

3. Articulation: sucking and swallowing reflexes very well established (so-called sucking instinct is probably a prenatal conditioned reflex in large part).

4. Sensory components: kinaesthetic sensation very considerably elaborated. Other sense organs are well developed and become functional at or shortly after birth.

5. Conscious Elements: The cortical and other structures involved in consciousness, and emotional and ideational processes have reached a high level of development, and it is quite probable that primitive consciousness, etc., already exists.

Notes

1. Development of movements follows order of acquisition of vegetative processes basic to the articulatory movements.

2. Low energy movements precede high energy movements.

3. Generalized movements precede isolated movements.

4. Voiced consonants precede voiceless (of same sound).

5. A vague, spreading primordial form of movement precedes the clearly defined movement.

6. The first production of the sounds of the consonantal pairs (b-p, m-n, l-r, d-t, g-k, f-v, sh-ch) is a sound between the two, the first sound listed (lower energy value) is the first to be sharply differentiated.

7. The rhythmic repetition (play) of the same sound groups precedes that of different groups (e. g., ba-ba-ba; fa-da-ga-de).

8. Individual variations, dependent upon experience of the child, may cause one type of movement to develop earlier and better than another.

E. g., if the baby has difficulty nursing, either because of scanty, slow flow of mother's milk or small hole and hard nipple on bottle, these sucking movements will be exceptionally well developed and m and n will be relatively earlier. On the other hand, if flow of milk is rapid, the baby will develop a protrusion of lips and strength of

tongue muscles to retard and control flow of milk; hence the sucking reflex (*m n* sounds) will be less rapidly developed than the b-p and d-t sounds.

9. The development of concentration in vocal play upon the kinaesthetic and auditory sensations brings a conscious control element into the acquisition of the refined or perfected sound.

10. The early "meaning" element of sound develops as a form of conditioned association reflex—response ("learned") to environment —"expressive" cries (involuntary) become conditioned reflex.

11. The development of conscious meaning and "words" appears to be closely associated with the phenomenon of the emergence of the "awareness of self,"—the differentiation into "self and not-self"—the development of vocabulary follows rapidly thereafter. This *self*-consciousness usually emerges rather suddenly. The sudden "starting to talk" which parents observe is largely due to this.

12. The development of structure of language:

1. Articulate sounds.
2. Words—nouns (naming) constitute whole sentence.
3. Verbs—*state* of individual, sentence = noun-verb (whether active or passive).
4. Modifiers—further "analyses" of environment.

13. Imitation; environmental patterns begin to influence speech shortly after age of vocal play—this influence increasingly important as speech develops into pattern of social communciation.

With this last development more detailed analysis of environmental stimuli becomes possible, affecting mainly the vocabulary.

Greatest influence of environment is on vocabulary, etc. Least influence on articulation, rhythm, melody (in order).

The influence of physiological determinants decreases and the "mental" influence increases in importance with above stages of speech emergence. Social influence in its wider sense latest.

The acquisition of phonetic speech is relatively independent of I. Q.; only with the complex development of vocabulary and syntax does "intelligence" become a major factor. Mental retardation may somewhat retard the acquisition of speech but, since a normal child of 18 month or two years talks, mental retardation alone cannot be a major etiological factor. Good health, nutrition and neuro-motor development are the most important determinants during infancy.

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KURZE AUSZEUGE AUS DEN VERHANDLUNGEN DER JAHRESVERSAMMLUNG DER JAPANISCHEN OTO-RHINO-LARYNGOLOGISCHEN GESELLSCHAFT IN KYOTO 1938

1. *Experimentelle Studien über den Stimm-einsatz und absatz.*—von Shintaro Nomura.

Der Verf. hat die Stimmen von verschiedenen Einsätzen und Absätzen mit allerlei möglichen Vorsicht mittels elektroakustischen Systems untersucht, dann wurden die Röntgenphotogramme von Kehlköpfen bei diesen Phonationsakten aufgenommen und es kam zu folgenden Resultaten.

1) Beim Weicheneinsatz tritt die Schallwelle langsamer auf und das Anfangsgeräusch ist undeutlich, dagegen tritt beim Harteinsatz die Schallwelle plötzlich auf und von der 2ten Welleperiode an wächst sie meistens ihre Amplitude bis zu ihrem Durchschnittsgrössen, deswegen ist das Anfangsgeräusch auffallend und entspricht dem Glottisschlag. Bei den anderen Stimmeinsätzen treten die Schallwellen etwas langsam auf.

2) Die Wellenform wird beeinflusst durch die verschieenen Einsätze auch dabei, wo die Wellen schone zum stationären Zustand geworden sind. Das ist ein Beweiss für die Tendenz, dass der betreffende Phonationsmechnismus eine Zeitlang fortdauert.

3) Bei gepressten Stimmen werden die Schatten von Ventriculi Morgagnii ziemlich undeutlich im Röntgenbild, und das Kehlkopfspiegelbild zeigt, dass dabei die Taschenbänder nach median unten verschieben und damit die freien Exkursion der Stimmbänder gehindert werden. Diese Tatsache sind der Beweis dafür, dass bei gepressten Stimmen die Mm. ventricularis als eine Teilerscheinung der grossen Kehlkopfspannung hochgradig spannen. Bei der weichen Stimmen sind diese Schatten sehr deutlich.

4) Nach der Kompliziertheit der den Einsätzen nachfolgenden Schallwellen sich die Einsätze in folgender Ordnung einreihen; Press-, Hart-, Hauch-, und Weich-einsatz.

5) Die Phonation in den Weichstimmen ist am leichtesten und am hygienischsten.

6) Unterschiede von jedem Stimmabsatz sind weniger auffallend im Vergleich mit jedem Stimmeinsatz.

7) Beim Kunstsänger scheinen die Unterschiede von jedem Stimmeinsatz undeutlicher zu sein als beim gewöhnlichen Menschen.

2. *Studien über die Artikulation der Sprache.*—von Toshio Shirôiwa.

Verf. messte den Luftdruck im subglottischen Raum bei zwei Fällen. Danach ist der Luftdruck im subglottischen Raum bei Artikulation der Sprache eines normalen Menschens dem bei reher

(*Continued on page 226*)

THE MOTO-KINAESTHETIC METHOD OF SPEECH TRAINING

EDNA HILL YOUNG

The meaning of the integration and co-ordination of the processes underlying automatic speech can not be experienced by the individual whose speech became correctly integrated in the early learning processes. Hence the following report of the subjective experiences of a subject whose speech habits were initially perforce abnormal.

The resulting discomfort in speech necessitated a very close study for a period of years to remedy the situation. The object of the study was to find the way to comfortable speech.

When the detailed movements, both of the subject's own speech, and those of normal speech had been isolated and compared, and she had practiced the correct movements until she felt ready to attempt the normal speech movements as a constant procedure, the real difficulty began.

The first learned habits tended to stand out clearly, as if determined to persist in the face of continued interference in functioning. The newer habits entering into the daily speech program tended to disintegrate a previously learned, usable—though uncomfortable—sequence. The subject found herself in a situation in which neither speech program could function automatically. She was aware of a constant conflict between the two procedures which tended to interfere seriously with all sentence production. A conscious mental effort was necessary for several years during all speech, in which the effort was divided between the thought, seeking expression, and the constant direction of the mechanics of speech. Such a division of attention also interfered with quick mental response. There was usually much tension throughout the whole musculature during those years, because of the effort required in daily conversation. The consciousness of tensions and conflicts varied somewhat, however, from time to time, according to social demands, physical health, and emotional status.

A continual analysis of this ever recurring condition showed that in this staus of disintegration of muscular processes:

1. Forces had been unleashed in these peripheral areas which were felt as something apart from automatic control.

2. These forces were felt sometimes as tendencies to move parts in directions established by former habit. It resolved itself in consciousness into the feeling of tendencies to move into definite directions or forms, with force, perhaps counter to the forms being instilled through new habit. The conflict of two definite procedures was the constant accompaniment of speech.

3. The conflict interfered with timing of movements, as the former habits persisted with tenacity, holding to their own former functioning before yielding.

4. The force of the struggle felt was great for several years, out of proportion in subjective experience to what might appear objectively.

5. At times when the subject was especially tired, as toward the close of the day, the tendencies to move in various directions and forms seemed to neutralize each other, leaving a feeling of total inertia, as if the muscles refused to respond further until rested. The mental faculties seemed dulled and over-exerted at such times and the temporary condition could be compared to motor-aphasia while it lasted.

The whole problem necessarily became one of vital importance to the subject in an endeavor to bring normal functioning out of this condition.

During the early years of study of individualized speech movements, the visual sense was the one necessarily employed by the subject to ascertain what movements constantly functioned in the production of a given sound. Through the visual, the subject sought to apply the correct movements to her own procedures. But simply to see the correct movements in the mirror did not influence the muscles sufficiently to permit them to function any more easily in speech.

Additional help was necessary. This help came by moving the mouth into the desired forms with the hand, while at the same time sensing the procedure—the direction of movement in those parts, feeling the necessary form coming on under direction, the timing as directed by the hand, all of which in turn was being guided by the conscious mind through its awareness of the pattern being taught.

The constant directing by the mind to omit incorrect movements and to substitute the correct ones was also an important help in retraining. Thus, a clear mental picture of the series of movements in order as needed for the sentence to be spoken became a vital help after a certain amount of learning had taken place through the Kinaesthetic.

In speech, apart from the formation of thought in the mind, there is the gaining of processes to be acquired in the muscles themselves. Since all speech is dependent upon muscular movements, it follows that speech-training is a definite muscular training, in which the best expression of thought through speech requires that muscles be ready to respond definitely, immediately, and without interference. The establishment of correct muscular learning means that the mechanics of speech have been mastered, and have become habitual. The correct movements or co-ordination of movements are ready to proceed as thought leads the way. In order to have this desired readiness in the speech mechanism, certain factors are necessary. Perhaps an analysis of the meaning of "movement" as used in this Moto-Kinaesthetic training might be in order. Movement in the abstract involves a greater or less degree of force to bring it about. If purposive, it also

involves a given direction in which to move. This direction may be in a straight line or in forms. Movement involves timing or rate of speed. Habituated muscular movement becomes in experience a moving force tending to repeat itself in direction. This force moves at a rate of speed determined by past habit. It uses a certain degree of tension or lack of tension depending upon the sound under production and its needs. These forces are called forth automatically through direction from the higher brain centers. These forces felt bilaterally sometimes function to balance each other; again they function in bringing about reversals of movements in parts controlled by paired muscles, and frequently act together to keep movement continuous in desired sequences of sound. To analyze the mechanics of speech, satisfactory functioning is dependent upon:

1. A previous learning process, in which paired muscles constantly function in reference to a mid-line, a bilateral use of muscles also in which the functioning is the same on either side of the mid-line. For example, in the production of words beginning with the sound of "w," two equal forces move against the mid-line, with equal power. The two equal forces also bring about the muscular rebound in the completion of this sound. Correct mid-line relationships are essential in the best use of the tongue movements. The use of the muscles of the two halves of the tongue should also be gained in correct relationship to the mid-line. It is very important for the ready, balanced use of the tongue in speech, that the learning in the two halves be such that the habituated feeling is that of holding toward the mid-line in speech. Just *enough pressure* toward the mid-line should be used, on both sides to keep the tongue balanced in the middle of the mouth. Habitual functioning toward one side of the mouth away from the mid-line is another way to interfere with the best functioning of the speech mechanism.

2. Certain movements carry with them more force than others, because of their use in other functioning of the body. The movements of the jaw in speech, because of the great force of which it is capable in biting, chewing, etc., would function better in many cases if directed into permanent channels during the learning period. The jaw movement functioning to one side away from the correct mid-line interferes with the best use of the mechanics of speech. We often find in speech that one has an habitual movement of the lower jaw outward, and yet the occlusion is normal. Thus there is an unnecessary daily expenditure of energy, doubling the amount of movement of the jaw.

The learning pattern displayed in the functioning of the joints, tendons, and muscles connected with the jaw movements may become fixed in a certain level in response to a given sound stimulus. For example, as the lisping child changes from "thaw" to "saw," the depression of the lower jaw needed during the formation of the "th" sound is at a lower level than that ordinarily used to produce an "s" sound. In correcting this faulty habit the trainer often feels strong resistance to change. The trainer learns to detect the tensions, the

resistances in muscles, etc., in the use of the Moto-Kinaesthetic method, and is helped thereby to understand more nearly the nature of the subjective experience.

3. Further, in analyzing the mechanics of speech, one finds that with muscles moving bilaterally, equally in pairs with reference to a mid-line, with jaw action ready to function with greatest ease, there are other necessary conditions in the learning process which help the fluent use of the speech mechanism—namely, the immediate localization of movement to begin words of a certain sound, as the lower lip becomes the place of movement to start all words beginning with "f," the end of the tongue, the place of movement for words beginning with "t," etc. To start the functioning of the correct muscles as the response to a given sound stimulus is to help to free the use of the speech mechanism.

The stimulation on the part of the trainer is made possible because the muscles are capable of learning to move or to function in a new way through the Kinaesthetic sense. Movement felt over a part tends to produce movement of that part in the given direction. A part moved through a certain form finds the way more easily to move through that form again. One of the greatest values of the use of the Moto-Kinaesthetic lies in the trainer's moving the mouth directly from the movements which produce one sound into those which normally produce the next in order.

Touching the point at the mid-line just above the upper lip outside, tends to bring the tongue end to that point inside the dental ridge, in directing movement for tongue-end sounds, etc.

The technique by which a trainer may guide the mouth correctly into new forms should be thoroughly learned before he attempts to apply it to others. But the results in the use of the Moto-Kinaesthetic technique justifies the trainer's effort in learning it.

Application of the method:

I. To the handicapped group.

Speech cases who have lost the normal use of one or more of the senses, which ordinarily function in acquiring speech, are aided perceptibly by the use of the Moto-Kinaesthetic method. The fuller use of the Kinaesthetic sense does compensate in some degree for the other loss. However, a special application of the method is needed for the teachers of each of the handicapped groups, in order to meet the needs of that particular group.

The deaf, the blind, the spastic, and the child with organic speech difficulty need all the help available. The direction of definite word and sentence patterns, associating the idea in the mind with the word-pattern in learning, gives added help to many.

II. To the child with delayed speech.

Many normal children pass through the usual age for speech acquisition without gaining their speech. To such children the usual

stimulation to eye and ear have lost their effectiveness. "Say book," "say boy," etc., often tends to make the child more negative in response because he has lost his interest in a process which heretofore has brought no pleasure nor success. This Moto-Kinaesthetic form of stimulation in bringing a more definite help to muscular action as well as a new form of help will generally awaken lost interest, and show the way to speech success.

III. To young children in the process of speech-acquisition.

A more extensive program for the prevention of speech difficulties can be brought about by giving more attention to the speech of the normal child, from at least eighteen months to three years of age. If, in addition to the stimulation of the auditory and the visual senses, in addition to the creation of a normal environment for the child, speech movements may be carefully directed in a step-by-step procedure, correct forms will grow into the child's speech.

The habituation of correct forms for the infant would minimize speech-difficulty in the older child and adult. The most far-reaching and effective work of the Moto-Kinaesthetic may be seen in the work with the very young child.

IV. The young stuttering child.

To the young stuttering child who frequently shows conflicts of muscle movement, more help should be given in stabilizing correct sequences of movement. Those factors which contribute to easy speech, such as the immediate finding of place of movements, correct timing, proper pressure and muscular tensions, can be gained through training under the Moto-Kinaesthetic Method.

COME TO THE CONVENTION

September 2–3–4, 1940

at Pennsylvania State College

(*Continued from page 220*)

Atmung sehr ähnlich. Der Druck steigert mit der Tonhöhe auf, aber sehr wenig und bei Uebergang in Falsett viel höher und sehr hoch bei in erschwertes Dekanülment. Bei der Artikulation der Konsonanten hat das Ansatzrohr verschiedene Formen durch die ihnen nachfolgenden Vokale und differente Zungenform durch Stimmansatz und zwar verändert nicht Zungenforme sondern auch Innenlumen des Halsteils.

3. *Beiträge zum Nasallaut.*—von Cotoji Satta u. Toshio Shiroiwa.

Verff. analisieren die Läute, mit den wir bei hochgestellter oder flachgestellter Zunge m, n, ng und sprechon.

Der bei hochgestellter Zunge artikulierte Laut hat besonders grosse Obertöne zwischen 2000 und 3000 Hz. Die Laute, mit den man m und n zwischen G (96) und c^1 (256) spricht, hat bei hochgestellter Zunge die Obertöne mit den breitesten Amplitude in der Nähe der 3000 Hz. und bei flachgestellter Zunge in der Nähe von 2000–2500 Hz.

M and n sind selbstverständlich ähnlich mit Vokal (u) auf Tonfilm, aber das Letztere hat relativ deutliche Obertöne von 1000–1500 Hz., dagegen haben die vonderen die von 2500–3500 Hz.

So halten sich die eigentümlich grossen Obertöne zwischen 2000 und 3500 Hz. für die eigentlichen Resonanzlaute mit Nasen und Nasenrachenraum, die für Nasalläute charakteristisch sind.

4. *Die experimentelle Untersuchung über die Bedeutung der Lähmung des anticus (M. cricothyreoideus) für die Phonationsstorung. IV Bericht.*—von Cotoji Satta und Y. Utumi.

Verff. haben die Absicht gehabt Internus- und Anticus-Lähmung zu vergleichen.

Durch Durchschneiden des M. vocalis versorgenden Astes des n. recurrens wird das Stimmband so entspannten, das das laryngoskopische Bild dasselbe zeigt, wie die sog. Intermuslähmung, aber dabei hat die Stimme nicht so niedrigere Tonhöhe, wie die bei Anticuslähmung und zeigt, eine geringe Absteigerung der Tonhöhe nach kurzer Zeit, was uns des leichtgradigen Befundes der Anticuslähmung erinnert.

Dieses laryngoskopische Bild ist den sog. mit Zweifell ganz entsprechend, aber das klinisch als Internuslähmung bezeichnete ist mehr oder weniger von Anticuslähmung wahrscheinlich begleitet, so ist die Ansicht weiter zu untersuchen, dass das klinisch als Internuslähmung genannte Bild nur durch m. thyreoarytaenoideuslähmung ausgelöst werde.

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IS STUTTERING PRIMARILY A SPEECH DISORDER?

ERWIN O. KRAUSZ, M.D., Ph.D.

To make my point clear I would like to start with the somewhat artificial differentiation between Speaking and Talking. Speaking may be defined as the ability to articulate. We all know that the stutterer is able to articulate the same words, syllables, letters or sounds very well at one time, at other times he cannot do it at all. He is able to do it when alone, when reciting, when singing, when reading. His defect, however, becomes manifest in certain Social situations when he has to Talk to another person or to certain other persons, such as his superiors, actual or imagined ones, persons of whom he expects criticism, comparison, and so forth. Talking, therefore, may be defined as Conveying a Message to another person by the instrument and vehicle of speech. It is in such moments when he has to convey messages, i. e., when engaged in such a definitely *social* activity that his trouble arises or also when he anticipates such a situation or is surprised by it. In other words, such social situations necessitate a special Effort that we have to make when conveying a message to another person, and it is this effort that the stutterer regards himself as unable to make. He believes himself so much unable to make this effort, is so convinced of his inability to ever succeed in making it that no amount of what might seem to us logical reasoning can shake a conviction which as I shall try to prove has obviously very definite signs and characteristics of a Compulsion.

I think it was Dr. Bluemel who first pointed out that, in the adult stutterer at least, we have to deal with two different phases which he called Primary and Secondary Stuttering. I am here interested mainly in the etiology and nature of the Primary Stuttering, the secondary one comprising, to quote C. van Riper, "various devices or methods for overcoming, hiding, or minimizing (their) stuttering." Investigating and analyzing the story that the patient gives us of his troubles we find ourselves confronted with approximately the following picture: Here is a person whose story proves that he is able to speak under certain circumstances but who neglects these occasions and lays his full emphasis on the other occasions when he is not able to do so and apparently does not understand, or does not want to understand, that this fact only proves that, under certain circumstances, he is unable to talk. At the same time he is convinced that there is something very much wrong with his speech, i. e., with his ability to articulate which inability, correctly understood, should be limited to the inability to use the proper articulation

under certain circumstances, viz., circumstances and occasions when he has to convey a message to another person. He knows, or believes he knows, that at such occasions he *should* be able to talk, but at the same time he knows, and what is more, he is convinced that he is unable to do so. To evaluate this syndrome properly I have to say a few words about the so-called Compulsion Neurosis.

We all know that the clinical definition of a Compulsion neurosis describes a condition in which the patient, without any doubt in his ability to do something, knows that he should *not* do something which, however, he believes he cannot avoid doing and which he believes he is compelled to do, e. g., seeing that the door is locked, that the water tap is turned off, or that his hands are spotlessly clean. Others believe in their urge to kill somebody and have to suppress this urge again and again, but all of them never doubt that they *can do* what they think they *should not* do. We may call this compulsion well known as it is a Positive Compulsion.

The stress in the Positive compulsion has to be laid on the fact that the patient does not doubt his ability to do something but actually battles himself all the time to avoid doing it. With the stutterer, however, we find a pattern which, although characterized by a similar compulsion-like conviction, could be described as follows: here the patient knows that he should be able to do something, viz., talk, but confusing speaking and talking, he is convinced he *cannot do* something which he knows he *should do* or *should be able to do*. In short, while the compulsion-like emotional make-up of the pattern is the same, the configurational part of the pattern is reversed, and the stress has been laid, and has to be laid, on his doubt in his ability to perform what is evaluated as a Normal action. It is the same doubt that we find in all forms of functional neuroses, as e. g., impotency, homosexuality, and such forms of neuroses as Bleuler, in his textbook, subsumes under the heading Expectation Neuroses. In my understanding, based on long years of experience and as I shall try to prove more elaborately in my book on the "Psychotherapy of Neuroses," all these functional neuroses are what I may label Negative Compulsions, and as far as I can see they also comprise Stuttering.

With this classification in mind we are bound to find, in the process of therapeutic investigation and procedure, a few interesting facts. We cannot help to recognize, by means of dream analysis and by means of an analytical evaluation of the self-interpretation of the patient, that his contention, viz., he would give anything to be what he regards as normal is not only not true, but that he actually spends the greater portion of his energy and time in proving that he, to quote Artemus Ward, "knows something what ain't so." There is a good term to describe the *lending of reality* to something what ain't so and making something of an imaginary quality *real:* I mean the term Re-ification, derived from the Latin: aliquid rem facere—to make a thing out of something which is not a thing—a term frequently used by logicians and philosophers. We therefore find that

the stutterer re-ifies again and again his doubt that he cannot speak while actually he cannot talk in certain situations to which, as they repeat themselves, he has become almost allergic. One of the commonest devices used in re-ification are emotions of all kinds, especially expectancies, anticipations or apprehensions, and fears. This fact has led many authorities to believe that stuttering and other functional neuroses should be classified under the heading of Anxiety Neuroses, but, while there is certainly anxiety in all forms present in all functional neuroses, to my mind the anxiety factor is, especially for therapeutic purposes, negligible and should be understood rather as an instrument to make the underlying compulsion more effective. Bearing this factor of re-ification in mind the therapeutist can almost confine his activity to pointing out to the patient the dynamics of his case, and, by the way, win his co-operation thereby to an unexpected degree.

The next very important and very difficult question is now how this compulsion-like belief or doubt, with all the vicious circles of reasoning attached to it, arises. My time only permits me to touch on the subject. An analytical investigation will invariably show that the stutterer has a somewhat distorted idea of what normal talking is like. He invariably believes that talking normally means: Speaking Without an Effort. In fact, he regards making an effort almost a sign of a speech defect, and in the process of re-ification uses "making efforts" as a means to further discourage himself. It is very hard to correct this idea in his mind and the best way, in my experience, is to make him understand, as this is something that he has experienced himself, that everybody, i. e., also the person with a normal ability to speak and talk, has to make efforts to convey a message when under a strain, say an examination or when fatigued, or when learning a new language, and once we can convince a stutterer that the effort he has to make is comparable to the one we have to make in learning a foreign language much of his emotional surcharge has been removed already. Another factor in the re-ification process is what I labelled the Time Factor. We find it almost regularly that the patient more or less consciously gives himself a certain time within which he expects to make some improvement. It goes without saying that the closer he comes to the limit he gave himself the more discouraged he gets because he will find that he still cannot talk effortlessly and we are confronted with relapses as when we see him completely blocked and stating he has been worse than ever and is making no progress and so forth.

With every stutterer being more or less conspicuously an extremist and perfectionist it is easy to understand what tremendous resistance the therapeutist has to expect from these very frequently neglected factors of re-ification. Seemingly a deviation from the answer to the question as to the possible etiology of the compulsion all this has a definite bearing on the problem. The fact is that, by an analysis of the erroneous concept of the stutterer with regard to the degree of effort one has to make in talking, or rather to the effortless

way of speaking "normally," we are led to the very initial psychological situation which is bound to give rise to the subsequent compulsion. Remembering here furthermore a typical characteristic of individuals with a functional neurosis, namely a certain tenacity which when called simply stubbornness is unduly minimized in its importance, and remembering, as dovetailed with this characteristic, the erroneous concept of the stutterer of what normal speaking and talking, or rather adult and mature speaking and talking, amounts to, we understand that in the infantile phase of the stutterer's personality development we meet with a phase of Unwillingness-to-talk-unless certain stipulations appear to him fulfilled. In other words, at a time when speech and the ability to convey messages through talking should be developed we discover a personality-in-the-making whose seemingly effortless attempts at articulation had been hailed either as the signs of brilliancy of a future genius or vice versa had failed to make an impression as in the case of a nervous, highstrung, self-concerned, unresponsive early environment.

Such experiences appear then to be followed by an Unwillingness to Talk. It is a period and manifestation of great *Indignation* at the violation of his rights and privileges, and the individual stutters and is unwilling to talk unless he expects and finds an environment willing to listen to him and to make the most of whatever he says as in the Good Old Days, or unless he expects to find an environment to be more willing to listen to him than the one of his original experiences, both of which possibilities in his pessimism he, as a rule, never actually expects. On this primary mechanism of an Unwillingness-to-Talk we then find very soon superimposed a Converted Mechanism which leads directly into the Negative Compulsion I have been speaking of, viz., the belief in his inability to speak, a mechanism developing from the inevitable environmental reaction to the more and more manifest defect, i. e., from the secondary gains of attention and privileging concern of parents and teachers and from the discouraging cruelties of thoughtless, sneering remarks which both only contribute to reinforce the growing individual in the confusion of his evaluational standards.

Being aware that these views had to be presented in a very abbreviated form, I only wish to point out briefly their therapeutic significance. First, the attention of the patient can be forcibly switched from his compulsionary belief that his is a speech problem to what underlies the problem, and this already is a great help releasing the patient's tension and attention to "knowing something what ain't so." Secondly, calling the stutterer's attention again and again to what he is actually and actively *doing*, namely, re-ifying into reality a primary Unwillingness to Talk and subsequently converting it into the compulsion-like doubt about his ability to talk makes the treatment dynamic and dramatic, and reveals the underlying *Invalidism* of this particular functional neurosis. Thirdly, these therapeutic viewpoints equip the patient with an initial capital of optimism and courage based on more than the mere assurance that

he finally has a good chance to improve. In the fourth place these viewpoints enable the therapeutist to build in, on the basis of a correction of the patient's concepts of so-called normal efforts and by the elimination of the Time Factor, such exercises (if necessary) as are required for the learning of a new language. They also protect the stutterer from slipping back into otherwise scarcely avoidable periods of discouragement and depression which periods are bound to undermine the sustained efforts necessary for a final improvement of his ability to talk. Finally, the psychotherapeutic approach based on this diagnostic and etiological interpretation of the stutterer problem as a (Negative) Compulsion Neurosis reveals it as a variation of a complex personality problem. Otherwise it seems to me the stuttering problem, whether understood as a speech problem per se, or as an anxiety neurosis, somehow remains a category in itself with certain specific characteristics which, in their specificity, are hard to understand and to correct.

It may be added that both myself and Mrs. Frances Perlowski Gaines, of Chicago, have used the principle and technique outlined above quite extensively and with very satisfactory results.

Federal Security Agency,
U. S. Office of Education,
Washington

STATE DIRECTORS AND SUPERVISORS OF SPECIAL EDUCATION HOLD CONFERENCE IN WASHINGTON

At the invitation of the U. S. Commissioner of Education, John W. Studebaker, State directors and supervisors of special education for exceptional children in day schools assembled in Washington for a two-day conference on June 26 and 27, 1940. This was the second meeting of the group in Washington, a similar conference having been held in September, 1938. Numerous problems relating to State organization and supervision for mentally and physically handicapped children constituted the major theme of the conference, and plans were made for continuing committee service and group action. Of paramount importance among the declarations of the conference was the following:

> This conference reaffirms its faith in the basic objectives of American education. In our democracy the objective of equality of opportunity for all implies respect for the integrity and worthwhileness of individual human personality. It implies equity of opportunity of a kind which for all children aims to adjust educational organization, equipments, procedures, and curriculum to the unique needs of individuals.
>
> We reaffirm our faith that these principles apply with equal force to the understanding and education of those who by unfortunate circumstance of inheritance or accident present problems unique in nature and difficulty. To the handicapped

child the accepted ideals and objectives in a democracy require, as for all children, opportunity for a satisfying measure of self-realization, and opportunity for such appropriate and adequate care and education as may contribute to an effective degree of social and vocational efficiency.

In the light of the convictions enunciated above, that which for lack of a better term is called "special education" for exceptional children becomes only an application of the ideals of an education suited to the needs of every child in school, and "special classes" become only one of the means of grouping children in a way that seems to provide that "equity of opportunity" which is the right of all. The conference urged that each State make a careful evaluation of the extent to which all handicapped and otherwise exceptional children within its borders enjoy such equity of opportunity. It re-emphasized the need for setting aside adequate funds to make equity of opportunity for exceptional children possible. It recommended enactment of suitable legislation and the adoption of progressive policies enabling the State to administer and to supervise a satisfactory program for the education of exceptional children in isolated rural districts and small communities as well as in its metropolitan centers.

A wide variety of questions was proposed for further study and analysis and plans were made looking toward the publication of informative material designed to be helpful in the further extension of State programs for exceptional children in day schools. At the present time there are 13 States in which one or more full-time persons on the State educational staff have been assigned the definite responsibility of supervising a State-wide program in this field. These are: California, Colorado, Connecticut, Delaware, Massachusetts, Michigan, New Jersey, New York, Ohio, Pennsylvania, Virginia, Wisconsin, and Wyoming. In three additional States, Kentucky, Maryland, and Minnesota, the part-time services of one person are available, and in several other States an informal arrangement obtains by which someone on the State staff assumes certain limited responsibilities related to the program. The problems of special education for exceptional children are in every State sufficiently important and sufficiently extensive to warrant the appointment of at least one full-time person to supervise the work. It is one of the continuing objectives of the Conference of State Directors and Supervisors of Special Education to bring this need to the attention of State educational officials in every part of the country and to encourage a plan of organization which will make the education of exceptional children an integral part of the total elementary and secondary school program of the State.

The conference adjourned to meet again in New York City on February 19 and 20, 1941, immediately preceding the annual meeting of the International Council for Exceptional Children to be held in that city. At that time it will consider further plans for organized action to safeguard and to expand educational opportunities for exceptional children in the respective States.

Program of American Speech Correction Association

Pennsylvania State College

SEPTEMBER 2, 1940

Monday Morning:

9:00. Registration

10:00. Group Conferences
Committee Meetings

11:00. Group Luncheons

Monday Afternoon:

1:00. Technical Papers
Business Meeting

Monday Evening:

8:00. Presidential Address

9:00. Smoker for the American Association for Applied Psychology at which the American Speech Correction Association is host.

SEPTEMBER 3, 1940

Tuesday Morning:

9:00. Clinics
Clinical Symposia

11:00 to 1:00. Joint Symposium with the American Association for Applied Psychology. The speakers represent the Clinical and Educational Sections of this group and the American Speech Correction Association.

Tuesday Afternoon:

2:30 to 5:30. Clinics and Clinical Symposia

Tuesday Evening:

7:00. Annual Dinner of the American Speech Correction Association

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SEPTEMBER 4, 1940

Wednesday Morning:

9:00. Technical Papers
Business Meeting

12:00. Convention of the American Speech Correction Association ends

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Program Note: The final programs of the American Speech Correction Association and the American Association for Applied Psychology, together with a Convention News-Letter will be mailed to each Fellow and Associate on August 21st.

THE RELATION OF REPETITIONS IN THE SPEECH OF YOUNG CHILDREN TO CERTAIN MEASURES OF LANGUAGE MATURITY AND SITUATIONAL FACTORS

Part II*

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Part I of this series of articles dealt with repetitions of syllables, words, and phrases in the speech of preschool children observed during free play. The second portion of this research concerns some of the factors which may superficially appear to be instrumental in the development of the phenomenon of repetition, namely language development. Adams (1) approached the problem of relating repetitions to measures of language growth, but he did not fractionate repetitions, nor did he draw any direct comparisons between repetitions and language growth. Consequently, his study is suggestive but does not answer the question of relationship conclusively.

Language maturity is a term which needs further delineation in this report. In this study it refers to measures of vocabulary extent, percentage of incomplete responses, percentage of simple responses, percentage of complete responses, number of speech sounds correctly articulated, length of response, percentage of functionally complete responses, and the proportion of intelligible responses.

Samples of speech for each of sixty-two preschool children between the ages of two and five years were collected in two half-hour periods chosen from the free-play portion of the preschool routine. This material furnished the basis for the structural analysis of each child's speech. The first step in the analysis was the determination of the limits of each response and the establishment of the mean length of response for each child. A response was considered to be a speech unit which was either a complete sentence or a portion of a sentence if the latter was set off by pauses. The pauses were noted while the recording was being done.

The counting of words for the establishment of the mean length of response offered some problems. The criteria used by McCarthy (2) were a guide.

1. Contractions of a noun or pronoun and a verb were considered as two words because both are essential to the response if it is to be considered grammatically complete.

*This study was done in the Iowa Child Welfare Research Station and the Speech Clinic, University of Iowa. It was directed by Wendell Johnson.

2. Contractions of a verb form and "not," such as "won't" and "can't" were scored as one word. Since the child presumably has little knowledge of reading and writing, he probably thinks of "can" and "can't" as the two possibilities in expression. If he uses "cannot" it is highly improbable that he associates it with the contracted form "can't."

3. "Lookit" was scored as one word if it served in the capacity of "look," and as two words if it served as "look at."

4. Hyphenated words which must occur together to convey thought were scored as one word, such as "teeter-totter."

5. Nonsense syllables were arbitrarily counted as words. With nonsense it is impossible to discern the limits of the pseudo-words, so some arbitrary practice had to be instituted.

6. After the establishment of word limits, the total number of words spoken in the entire hour was counted for each child. This is referred to in this report as the "verbal output."

The speech records were also analyzed for indices of language maturity. The degree of intelligibility was considered one gauge of maturity. Since understandability of language is essential to its communicative effectiveness, the degree of comprehensibility is an index to the facility with which it is used in communication. McCarthy's (2, p. 35) criteria of intelligibility were adopted. Three classifications were used, as described below:

1. "Comprehensible responses which included all responses that could be understood by the experimenter in spite of poor articulation, letter substitutions, or faulty or incomplete construction.

2. "Semi-comprehensible responses which included all responses in which the hearer (recorder) had a general idea of what the child was talking about, but could not get the full meaning because of the lack of certain key words in the sentence.

3. "Incomprehensible vocalizations which included all responses which were mere sounds forming no recognizable words, and which were entirely devoid of meaning to the hearer."

The McCarthy classification of grammatical complexity was used with one adaptation. First of all, responses were divided into two main groups: those that were complete and those that were incomplete. In a consideration of spoken language, we are impressed with the fact that much of adult language is fragmentary. Conversation among adults carries a multiplicity of responses in which a number of the elements of the sentence are omitted. Such responses as "all right," "fine," and "good" have neither subject nor predicate, and so cannot be considered a sentence, but the assumptions of the noun and verb are clear, and the response is adequate for communication. Because the child learns the language patterns which he hears, his speech should be judged in terms of a standard no more severe than that used for the evaluation of adult speech. Therefore, fragmentary

responses of the sort discussed above were termed "functionally complete but structurally incomplete responses."

The following classification was used in the structural analysis of the responses:

A. Complete responses.
   1. Functionally complete but structurally incomplete responses.
   2. Simple sentences without a prepositional phrase.
   3. Simple sentences with a prepositional phrase.
   4. Compound sentences.
   5. Complex sentences.
   6. Compound-complex sentences.

B. Incomplete responses.

C. Incomprehensible responses not analyzed structurally.

In this study, the functionally complete but structurally incomplete responses were treated as a unit, and the proportion of the total number of responses that this type represented was determined. Simple sentences both with and without prepositional phrases were combined to form the measure of simple responses. Compound, complex, and compound-complex responses were grouped to represent a measure of complex responses. The proportion of incomplete responses was also determined. These, then, were the measures of language maturity used in this study to represent complexity of response structure.

In the analyses described above repetitions of phrases were omitted from consideration, for in the case of whole response repetitions the saying of the response more than once would tend to weight the frequency of that grammatical construction on which the repetition occurred.

Vocabulary was tested by means of the Smith-Williams Vocabulary Test (3).

Speech sounds were tested on the Williams revision of the Wellman, Case, Mengert, and Bradbury Speech Sounds Test (4). This test was chosen because of the ease of administration and the clarity with which it detects speech sound errors.

Other tests of general maturity which were used included chronological age, mental age, and the intelligence quotient as determined by the Kuhlmann-Binet or the Stanford-Binet tests.

Five of the measures representative of repetition were correlated with the various measures of language maturity and general development. The measures of repetition chosen were the composite measure, instances of syllable repetition, instances of word repetition, instances of phrase repetition, and the sum of the instances of syllable, word, and phrase repetitions. (See Part I) Correlations of the Pearson product-moment type were determined for all of these measures, and the following results obtained:

TABLE I

CORRELATION OF VARIOUS MEASURES OF GENERAL DEVELOPMENT AND LANGUAGE MATURITY WITH FIVE MEASURES OF REPETITION

	Composite Measure			Syllable Repetition/ Verbal Output			Word Repetition/ Verbal Output			Phrase Repetition/ Verbal Output			All Repetitions/ Verbal Output		
	Cases	r	S.E.	Cases	r	S.E.	Cases	r	S.E.	Cases	r	S.E.	Cases	r	S.E.
Chronological Age	62	—.48	.098	61	.05	.128	61	—.30	.116	62	—.37	.110	62	—.48	.098
Mental Age	55	—.44	.109	54	.05	.136	54	—.35	.119	55	—.29	.123	55	—.46	.106
Intelligence Quotient	55	—.05	.134	54	—.04	.136	54	—.10	.135	55	—.04	.135	55	.03	.135
Verbal Output	62	—.08	.126	61	—.01	.128	61	—.27	.119	62	—.07	.126	62	—.30	.116
Mean Length of Response	62	—.38	.109	61	.04	.128	61	—.47	.101	62	—.33	.113	62	—.56	.087
Vocabulary	59	—.47	.101	58	.13	.129	58	—.27	.122	59	—.35	.114	59	—.46	.103
Number Correct Speech Sounds	61	—.53	.092	60	.08	.128	60	—.19	.124	61	—.47	.100	61	—.37	.111
Per Cent Intelligibility	62	—.23	.120	61	.12	.126	61	—.37	.111	62	—.28	.117	62	—.32	.114
Per Cent Incomplete Responses	61	.33	.114	60	—.009	.129	61	.17	.124	61	.25	.120	61	.21	.122
Per Cent Functionally Complete Responses	62	.17	.123	61	.20	.123	61	.34	.113	62	.13	.125	62	.39	.108
Per Cent Simple Responses	62	—.19	.122	61	.004	.128	61	—.47	.100	62	—.15	.124	62	—.47	.099
Per Cent Complex Responses	62	—.41	.106	61	.07	.127	61	—.30	.116	62	—.35	.111	62	—.42	.105

A consideration of these correlations leads to the following conclusions:

1. None of these correlations is sufficiently large to be considered the key to an explanation of repetitions. The largest is the correlation of —.56 between syllable, word and phrase repetitions divided by verbal output and mean length of response, and even this correlation can be considered indicative of little more than a trend.

2. Chronological age showed correlations of approximately the same magnitude with each of these measures except syllable repetition divided by verbal output. This would indicate that there was a tendency toward a decrease in repetition with age with the possible exception of syllable repetitions where it may be concluded that there was no relationship.

3. Mental age showed a slight negative relationship to all measures of repetition divided by verbal output, tending to indicate that with the exception of syllable repetition where no relationship was present, there was a slight tendency for repetition to decrease with increased mental age.

4. I. Q. showed low correlations with all measures; it can be concluded that there was no relationship present.

5. Verbal output showed no particular relationship except with word repetition divided by verbal output and instances of syllable, word and phrase repetitions divided by verbal output where there was a slight negative relationship.

6. Vocabulary showed a low correlation with negative direction with all measures of repetition except syllable repetition with which no relation was shown.

7. Correct articulation showed a low negative correlation with the measures of repetition except syllable repetition.

8. The degree of intelligibility showed a negative correlation with the measures of repetition except syllable repetition.

9. The percentage of incomplete responses had a slight positive correlation with measures of repetition except syllable repetition.

10. The percentage of functionally complete but structurally incomplete responses had a slight positive correlation with all measures of repetition.

11. The correlations with percentage of simple responses were all low and negative with the exception of syllable repetitions which was practically zero.

12. Complex responses correlated low negatively with measures of repetition, except for syllable repetitions in which the correlation was almost zero.

13. It would appear that the incidence of syllable repetition was not significantly related to any of these measures.

Because it has already been established that vocabulary, mean length of responses, number of correct speech sounds, intelligibility,

and percentage of complex responses are related to chronological age; chronological age was held constant and the partial correlations presented in Table II were computed.

TABLE II

PARTIAL CORRELATIONS WITH CHRONOLOGICAL AGE CONSTANT

	Composite Measure of Repetition	Syllable Repetition/ Verbal Output	Word Repetition/ Verbal Output	Phrase Repetition/ Verbal Output	All Repetitions/ Verbal Output
Mental Age	—.020	—.011	—.192	.106	—.073
Verbal Output	.234	—.043	—.137	.160	—.061
Mean Length of Response	—.049	.005	—.370	—.094	—.350
Vocabulary	—.107	.188	—.007	—.049	—.060
No. Correct Speech Sounds	—.462	.063	.007	—.325	—.087
Per Cent Intelligibility	.123	.115	—.241	—.056	—.012
Per Cent Incomplete Responses	.129	.017	.031	.089	—.026
Per Cent Functionally Complete Responses	.102	.212	.307	.073	.357
Per Cent Simple Responses	.108	—.029	—.382	.074	—.277
Per Cent Complex Responses	—.106	.049	—.127	—.130	—.122

Since mental age correlated .90 with chronological age, when chronological age is held constant in partial correlations, the correlations are also indicative of what would be found if mental age were held constant.

Because the instances of syllable repetition involved a noticeable sex difference at the various age levels studied, the boys and girls were separated and their scores on instances of syllable repetition were correlated with these various measures of maturity.

TABLE III

SYLLABLE REPETITIONS DIVIDED BY VERBAL OUTPUT

	Girls	r	Boys	r
Chronological Age	26	—.04	35	.05
Mental Age	23	.002	31	.04
Intelligence Quotient	23	.23	31	—.20
Verbal Output	25	.17	35	—.28
Vocabulary	25	.21	35	.03
Number Correct Speech Sounds	25	.02	33	.05
Per Cent Intelligibility	26	.14	35	.08
Per Cent Incomplete Responses	25	—.05	35	.01
Per Cent Functionally Complete Responses	26	.05	35	.32
Per Cent Simple Responses	26	.11	35	—.14
Per Cent Complex Responses	26	.06	35	.02

Summary and Conclusions

In this study an attempt was made to relate syllable, word, and phrase repetitions to various measures of language maturity. The data were obtained by recording verbatim the speech of sixty-two preschool children for a period of one hour chosen from the free-play portion of the preschool day. The repetitions found in this sample of speech were related by the correlation technique to measures of language complexity derived from the same speech sample.

From these measures of relationship it was concluded that language maturity as measured in this study cannot be considered an important factor in relation to repetition. When chronological age was held constant, the correlations tended to become even lower, although the relation to chronological age itself was not marked. To say that chronological age is important to a certain degree has no meaning, for in all probability it is not mere age that exerts the influence, but some as yet not uncovered factor of maturity which correlates with age. Correlations of syllable repetition alone and the measures of language maturity with boys and girls separated gave relationships which were almost insignificant.

From these findings it may be concluded tentatively that if it is desired to find the explanation for the large number of repetitions found in the speech of preschool children (see Part I) it must be sought elsewhere than in the area of language maturity, that is, that the child repeats because he is not adept at using language in the conventional manner.

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(3) **Williams, Harold M.,** and **McFarland, Mary L.** A revision of the Smith vocabulary test for preschool children. (In) Williams, Harold M., McFarland, Mary L., and Little, Marguerite F., Development of Language and Vocabulary in Young Children. Univ. Iowa Stud., Stud. in Child Welfare, 1937, 13, No. 2, Pp. 94. (pp. 47–94).

(4) **Williams, Harold M.** An analytical study of language achievement in preschool children. (In) Williams, Harold M., McFarland, Mary L., and Little, Marguerite F., Development of Language and Vocabulary in Young Children. Univ. Iowa Stud., Stud. in Child Welfare, 1937, 13, No. 2, Pp. 94. (pp. 9–18).

Part III

It seems a fair assumption that many repetitions in speech may be associated in some manner with the semantic reactions of the speaker to the situations in which he finds himself. Case histories and reports of interviews obtained in the Speech Clinic of the State University of Iowa show that parents and guardians of repeating children believe that the child repeats relatively more in certain definite situations. These situations, as reported, show variation from child to child. Frequently mentioned in this connection are situations involving "fear," "excitement," "anger," and "thwarting." Since the so-called "stuttering child" does not live in a vacuum, but is reacting to the social stimuli about him, it cannot be said categorically that the given speech reactions which he exhibits are "abnormal." It is not known to what degree the so-called "normal speaking child," when placed in the same circumstances with the same semantic reactions to them, would or could retain nonrepetitive speech.

The problem in this portion of the study was to attempt an answer to the question of how extreme magnitudes of repetition relate to situational factors.

The technique used to furnish data for the approach to this problem was the observation of sixty-two children of preschool age. One recorder wrote verbatim all that was said by one child during two half-hour periods of observation during the free-play period in the preschool routine. Another observer was present who recorded as much as was possible of all that was said to the child and also the activity of the child and his companions. The second observer was asked not to interpret the situations, but to keep the record as nearly as possible on the descriptive level. He was cautioned to be most explicit in describing the situations surrounding the appearance of repetitions. The influence of the two recorders on the child's speech can best be gauged by the reactions of the children. Both recorders attempted to keep in the background, avoiding a marked scrutiny of the child under observation while close to him. It was felt that neither observer was accepted in the same status as the preschool teachers, but rather as part of the furnishings. All conversation with the recorders was discouraged. It is thought that the recording attracted very little attention, for on only three occasions was any direct mention made of the process, and in only one of these did the child imply by his remarks that he thought that he was being watched.

The method of analysis of the data for repetitions was described in Part I of these articles: In connection with the situational analysis it was hoped to ascertain whether or not each repetition would be found accompanied by some recognizable factor or factors in the environment or situation which might succinctly account for its occurrence at that precise moment, and not at other moments chosen at random in the hour studied. This plan was abandoned because of the difficulty of discovering such factors. At this point there seemed

such a superfluity of situations surrounding the repetition that no selective situations seemed to be present. This was true for one of two reasons: either there is no systematic situational tie-up for all repetitions or else the data on situations were too meager to reveal it.

It was observed, though, that in relation to extremes of repetition, those instances when a child uttered the same syllable, word, or phrase three or more times, certain situational factors could be recognized. Whether this is indicative of the true state of affairs surrounding repetitions, or whether it is the result of more care on the part of the recorder of situations in the presence of more extremes of repetition is a moot question.

An attempt was made to discover whether there were any types of classification that would include all the situations which appeared to foster extremes of repetition. Such a classification was developed in the following manner: Each extreme repetition was studied and an abbreviated description made of the activity accompanying it. From these descriptions the classification was built by a certain amount of grouping. Of course systematic measurement of the psychological forces at play in any of these situations was not feasible, so the classification was kept as nearly descriptive as possible. It should be remembered that these situations are *accompaniments* of repetition and also that each situation is discrete, grouping being used only in the hope of showing general tendencies. The writer is aware that these situations which are classified under any one grouping are not equal semantically ($\text{situation}_1 \neq \text{situation}_2 \neq \text{situation}_3$), and it is intended that the reader will evaluate any such groupings of situations accordingly, cognizant of the difficulties encountered in any such attempt at classification.

Before giving the situational findings it is well to have some conception of the proportion of all repetitions which the group studied included. It was found that 53.8 per cent of all syllable repetitions, 23.9 per cent of all word repetitions, and 15.6 per cent of all phrase repetitions were two or more in extent. It is interesting to note that syllable repetitions, which are conspicuous in every portion of the study, stand out here also as the measure in which more than half of the instances fall in what might be termed the "extreme extent range." Furthermore, it was found that thirty children presented no syllable repetitions two or more in extent, while eleven children presented only this type of syllable repetition. Nine children showed no extreme word repetitions whereas the balance of the group clustered around twenty-five per cent as a peak with the scores of ten children falling there. Extremes of phrase repetition skewed toward the higher percentages with thirteen children showing no phrase repetitions of this type, and only one child rated as high as fifty per cent. None of these three distributions could be considered "normal."

With phrases there was a clustering about the low end of the scale, and with both syllable and word repetition there was a clustering at two points, which was most marked in the case of syllable repetition.

The classification which was developed was as follows:

The child:

wants an object possessed by another child.
wants to perform an activity in which another child is engaged.
tries to attract attention of teacher.
tries to attract attention of child.
wants to direct activity of teacher.
wants to direct activity of child according to own plan.
wants to direct child out of play group.
asks teacher for information.
asks teacher for object.
asks teacher for privilege.
shows excitement over own activity.
receives coercion from teacher with object taken.
receives coercion from teacher with activity changed.
receives coercion from child with object taken.
receives coercion from child with activity changed.
offers criticism of child or his activity.
boasts to teacher.
boasts to child.
shows surprise or astonishment at a child's possession.
shows surprise or astonishment at a child's activity.
upholds status in spite of another child.
describes an object or activity to another.
offers information to the teacher.
offers information to child.
appears to be trying for social acceptance or approbation.
reports misconduct of a child to teacher.
appears unable to think of next word or idea.
defies the teacher.
appears unable to find an object he searches.
appears unable to find an individual he searches.
is afraid or in pain.
miscellaneous.

With respect to the order of rankings of the various situations, when the instances of all types of repetitions for all age-sex groups were combined, the following presented themselves as outstanding:

Rank	*Item*
1	excitement over own activity.
2	wants to direct activity of another child according to his own plan.
3	attempts to attract attention of child.
4	coerced by teacher resulting in changed activity.
5.5	attempts to attract attention of teacher.
5.5	upholds status in spite of another child.
7	offers information to another child.
8	wants an object possessed by another child.
9	criticizes another child.
10	offers information to teacher.

When the rankings were based on instances of syllable repetition alone the order was as follows:

Rank	*Item*
1	wants to direct activity of another child according to his own plan.
2	excitement over own activity.
3	coerced by teacher resulting in changed activity.
4	wants an object possessed by another child.
5.5	upholds status in spite of another child.
5.5	offers information to teacher.
7.5	offers information to child.
7.5	asks another child for information.
9.5	attempts to direct activity of teacher.
9.5	attempts to attract attention of teacher.

Word and phrase rankings were similar. Rankings based on the number of children represented in relation to instances of repetitions, and the mean percentage of each child's repetitions for syllables, words, and phrases for each situation in each age group show very similar rankings to these mentioned above.

The conclusions to be drawn from this study may be summarized, if we wish to consider the subjects used here as an adequate sample, as showing that all children in the age range of from two to five years repeat. Indeed, that though the amount of repetition differs from child to child, repetition is part of the speech pattern of all children. Repetitions of words and phrases decrease with age if the ages compared are far enough apart, but syllable repetition appears to be only slightly affected by age changes within this range. From the second portion of the study it was found that language maturity as defined herein relates only slightly to any of the types of repetition. The next area of inquiry is that which pertains to the situations themselves. It would be fruitful from the preventive standpoint if factors relating to repetitions could be found. Most studies dealing with so-called "stuttering" have been carried on with adults or near-adults, and there may be helpful material at hand if attention is given to those potential "stutterers," or individuals who may later attach pathological significance to their repetitions. It is of course trite to state that something acts as the adequate stimulus for repetitions. Repetitions in speech do not occur rhythmically. For some reason or reasons a child repeats at one particular instance and not at another. The factors which relate to these instances of repetition may furnish a lead to the means of their curtailment. The fact that "language maturity" does not appear to relate to amounts of repetition simplifies the problem in that one possible assumption of a source of influence on repetitions may be eliminated.

Assuming that situations, as described and as related in this study to repetitions, are important to the fluency of the speech of children of preschool age, the preventive and therapeutic problems become then matters of the manipulation of the environment. Such a view is far from new, but has been reflected for years in the remedial work

done by those speech correctionists who favored a psychological approach to the problem of the correction of nonfluent speech. The results of this study give a small amount of weight in favor of such an approach and in addition avoid in slight measure ambiguity and interpretative uncertainty by eliminating generalized emotional descriptions such as "fear," "thwarting," etc. It is often asking the impossible to suggest to a parent that he alter the home environment to give the child more "security" with a minimum of "thwarting" experiences present. It is possible, though, to suggest to parents that they listen, that is, give their attention to the child, when addressed by him with the hope on the part of the clinician that it may be done. It is possible to tell parents to attend when the child wishes to have them do something, being careful that refusals to act in the manner wished are handled in an adult fashion so that the child does not build "tensions" over situations of asking favors of the parents.

The writer is aware of the many limitations of the portion of the study dealing with situations. Too great generalization from the preschool situation to the home might be dangerous. Future research might attempt an uncovering of repetition-fostering situations in other environments with the view to seeing how much overlapping there is from one environment to another. With such information at hand it might be possible to list "danger-points" of child management which have their significance reflected in the degree of fluency of the child's speech.

Do not forget to attend the Convention at Pennsylvania State College September 2, 3 and 4, 1940, before your school starts— Why not make it a part of your vacation?

A SURVEY OF SPEECH DEFECTIVES IN THE INDIANAPOLIS PRIMARY GRADES

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There is no field of learning into which the modern school system of today is not willing to delve in the endeavor to fit a child to make the most of life. For a number of years the Indianapolis Public School system has been broadening its work with handicapped children. Up to the time of this investigation little or no work had been done in this system with the speech-defective child for the extent of this particular type of difficulty was unknown. The survey here reported endeavored to discover whether the speech defective presents a problem to the school system, especially in the earlier grades. Since grades 1–4 have been shown to be the focal point of most defects as revealed in other investigations, the inquiry was accordingly limited to those grades. Only two factors were considered of importance in the survey. If it were found that a high percentage of the school population suffered with the major types of speech disorders, a distinct social problem would be established, since it is generally recognized that persons with speech disorders are handicapped socially. A fact of equal importance with reference to the system is the matter of retardation. If the speech defectives generally were found to be retarded in school work, a distinct educational problem would be established.

The Problem

The problem has many phases:

A. What proportion of the primary school population are suffering from speech defects?

1. What defect is most prevalent?
2. What relationship exists between speech defects and Age? Grade?

B. What have other cities discovered about their speech defectives?

1. How do these findings compare with this particular investigation?

Sources of Data

Data have been obtained from by-laws and handbooks of boards of education; from school reports, personnel studies, general school department files, research data and school surveys as supplied by

cities of comparable size to Indianapolis and from interviews, lectures, books, periodicals, Government publications, returns from questionnaires, and field work. The investigator selected twelve schools as representative of a cross-section of the entire primary-elementary school system chosen on the basis of seven distinct social-economic classifications. These are as follows: (A) Foreign and very poor white (#5); (B) Rooming house district and transient (#2); (C) Very poor white, (#12, #15); (D) Poor white factory worker (#21, #34); (E) Average (#39, #57, #54); (F) Semi-rural (#49); (G) Better and more prosperous (#84, #76).

The Problem Investigated

Educational systems should play their part in teaching correct use of the vocal mechanism. Such pedagogy would be constructive education, and it would help eliminate much of the "wear and tear" on mind and body. Since it is axiomatic that well rounded tones are more pleasant than carelessly formed sounds, a feeling that one can speak in properly inflected tones, clearly, without stumbling, is a great step forward in character building. The action is rapidly gaining momentum. Back as far as 1893, according to Root[1], Hartwell secured a small amount of data with reference to stutterers in the public schools of Boston.[2] In 1911 Conradi investigated 87,444 school children in six American cities to secure information relative to the intellectual progress of stutterers.[3] A minor study made in 1913, of 3,010 pupils in ten graded elementary schools in New England was reported in 1914.[4] Two surveys were made in 1916. The first was a study of 89,057 pupils in the city schools of St. Louis by Wallin;[5] the second, a study of 4,862 pupils in the public and parochial schools of Madison, Wisconsin, by Smiley Blanton.[6]

Several studies of interest have been made outside the United States, the greatest attention, however, being given to the stutterers. Denhardt gathered data on 6,206 stutterers in Germany as early as

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[1]A. R. Root, "A Survey of Speech Defectives in the Public Elementary Schools of South Dakota," *Elementary School Journal*, Vol. 26 (1926), pp. 431–441.

[2]Edward Mussy Hartwell. "Application of Laws of Physical Training for the Prevention and Cure of Stuttering," *Proceedings of the International Congress of Education of the World's Columbian Exposition*, Chicago, July 25–28, 1893, under charge of the National Education Association of United States, pp. 739–49.

[3]Edward Conradi. "Speech Defects and Intellectual Progress," *Journal of Educational Psychology*, III (Jan., 1912), pp. 35–38.

[4]A. Chester Tucker. "Impediments of Speech in Children—How to Overcome Them," *Education*, XXXIV (Feb., 1914), pp. 354–60.

[5]J. E. W. Wallin. "A Census of Speech Defectives among 89,057 Public-School Pupils—A Preliminary Report," *School and Society*, III (Feb. 5, 1916), pp. 213–16.

[6]Smiley Blanton. "A Survey of Speech Defects," *Journal of Educational Psychology*, VII (Dec., 1916), pp. 581–92.

1890.[7] Von Sarbo secured data from 231,000 pupils in the cities and towns of Hungary in 1901.[8] Westergaard made a study of 34,000 Danish school children in 1898,[9] and Lindberg made a study of 85,000 city children and 212,000 country children in Denmark in 1900.[10] Chervin endeavored to secure data concerning the extent of stuttering, particularly among the adult population and the soldiers in various nations.[11] Rouma made a study in 1906 of 14,235 Belgian children.[12]

Wallin found that

> "Stuttering is more prevalent among normal, retarded, and backward children than among mental defectives. . . . only one of our morons stuttered, while none of the imbeciles stuttered."[13]

However, defects of articulation were "distinctly more prevalent among mental defectives."

Binet tests of children with speech defects in the St. Paul, Minnesota schools showed that such children were neither duller nor brighter than other children. The median I. Q. for 402 pupils was 97.7.[14] Unfortunately, however, at the time of this investigation, a *uniform* intelligence testing campaign had not been undertaken in Indianapolis; hence, records were unavailable for analysis and comparison.

All studies of the subject both in this country and abroad seem to indicate that the defective speech child is retarded in school, but this does not by any means hold for all such pupils. Wallin, from his survey in the St. Louis, Missouri, school concluded that "speech defective children tend to be pedagogically retarded to a greater extent than the non-speech defective."

The mean of the total prevalence of speech defectives in Indianapolis schools was found to be 2.94% (Table I), of which 1.88% were males and 1.06% were females. According to Wallin,[15] St. Louis has

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[7]R. Denhardt. *Das Stottern.* Leipzig: E. Keil Nachfolger, 1890.

[8]A. von Sarbo. "Statistik der an Sprachstorungen Leidenden Schulkinder Ungarns," *Medizinisch-padagogische Monatsschrift fur die gesamte Sprachheilkunde* (1901), pp. 65–89.

[9]H. Westergaard. "Von der Haufigkeit der Sprachgebrechen," *Medizinish-padagogische Monatsschrift fur die gesamte Sprachheilkunde* (1898), pp. 1–8.

[10]K. Lindberg. "Zur Haufigkeit des Stotterns bei Schulkindern," *Medizinisch-padagogische Monatsschrift fur die gesamte Sprachheilkunde* (1900), pp. 281–86.

[11]Arthur Chervin. *Begaiements et Autres Maladies Fonctionelles de la Parole.* Paris: Societe d'edition scientifigues, 1902, pp. 149–277.

[12]George Rouma. "Enquete Scolaire sur les Troubles de la Parole chez les Ecoliers Belges," *Internationales Archiv fur Schulhygiene,* II (1906), pp. 151–90.

[13]J. E. W. Wallin. *Speech Defective Children in a Large School,* Oxford, Ohio: Miami University, Bulletin XXV, No. 4, December, 1926, p. 18.

[14]Margaret Lima. "Speech Defects in School Children," *Mental Hygiene,* XI (October, 1927), p. 785.

[15]J. E. W. Wallin. *Op. cit.*

2.8% of its children suffering from some phase of speech difficulty; Liverpool, England, has a 2.5% occurrence. New Orleans finds 2.2%, and Kansas City and Milwaukee both report 2.46%. Therefore, the assumption that the Indianapolis situation is relatively more serious than cities of comparable size is not without proof. Likewise, if the group of 3,602 pupils studied is considered representative of all primary-elementary school pupils of Indianapolis, there are not only the 106 cases actually found, but approximately 636 cases in the entire system *in the first four grades only*. The defect make-up of this total will be dealt with later.

TABLE I

PERCENTAGE COMPARISON OF TWELVE SURVEYED SCHOOLS ACCORDING TO MALE, FEMALE, AND TOTAL PREVALENCE OF DEFECTS

Total Prevalence as to School*	Male Prevalence as to School*	Female Prevalence as to School*
#57—5.71%	#57—4.89%	#12—2.13%
# 5—3.84	# 5—3.84	# 2—1.96
#12—3.65	#15—2.67	#76—1.89
#34—3.51	#49—2.42	#34—1.25
#49—3.50	#34—2.26	#21—1.09
#15—3.47	#39—1.71	#49—1.08
# 2—3.13	#12—1.52	#15— .81
#76—2.64	#84—1.41	#57— .80
#39—2.39	# 2—1.18	#59— .68
#21—1.90	#21— .81	#84— .35
#84—1.76	#54— .78	#54— .26
#54—1.05	#76— .75	# 5—....
Mean 2.94	1.88	1.06

*In relation to individual school population for the first four grades.

Of the 106 aforementioned cases, it was found that 42.45% of reported defects were Indistinctness (Chart I), 17.92% were Stammerers, 14.15% for both Baby Talk and all remaining and 11.32% were Lispers. Dividing this total of 106 cases into the respective sexes, we note that the sixty-eight male cases were separated into 41.17% Indistinctness (Chart II), 14.70% Stammering, 10.29% for both Baby Talk and Lisping, 5.88% for both Lisping and Baby Talk (as one defect), and Other Types, with 11.76% for all remaining that were not in the above categories. Upon the comparison of these two sets of figures it will be observed that the three leading defects for the males are identical with those of the total of all cases reported. Two extra defects, however, make their appearance in major proportions among the males, namely, Lisping, Indistinctness and Baby Talk, together with Other Types than mentioned in the questionnaire. Female defectives, (Chart III) numbering thirty-

eight, were divided between 44.73% for Indistinctness, 13.16% for both Baby Talk and Stammering, 10.52% for Lisping, 7.94% for Lisping and Baby Talk (as one defect), and 5.26% for both Indistinct and Baby Talk and all remaining defects. We are now in a position to draw the conclusion that the four leading defects among both sexes are identical, though in varying proportions and percentages.

The total range of the speech disorders in the respective grades was found to vary no more than 3% (Table II). Male defectives were concentrated more heavily in the 1B (5.85%), with the 4B

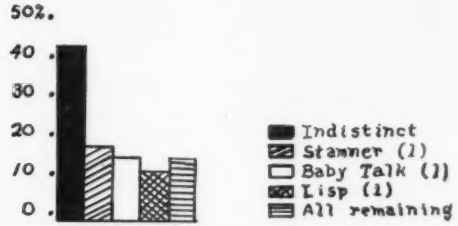

CHART I. Defect percentage of 106 male and female cases of speech difficulty (2).

(1) Includes *all* cases whether in combination or not.
(2) In relation to those classes only enrolling speech defectives.

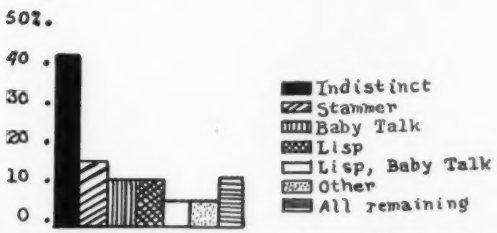

CHART II. Defect percentage among 68 males.

evidencing the least (2.92%). Strangely enough, females showed their *least* need in the 1B and their greatest in the 3B. Totalling, we discover the greatest male and female concentration to be in the 1A with the least in the 4B. It is interesting to note the increase in the percentage in the 4A. Whether this increase would be consistent during the fifth and following years or not is problematic. Root's findings in the schools of South Dakota[16] indicate that the greatest

[16] *Op. cit.*, p. 438.

percentage of defectives is in the first grade (no information being given as to semester ratings of B and A) with the least in the fourth year. He also found an increase in the fourth year over that of the third. Chart IV shows the relative fluctuation of male and female defectives from grade to grade. Where the per cent for the males

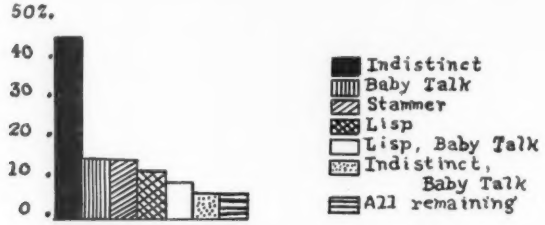

CHART III. Defect percentage among 38 females.

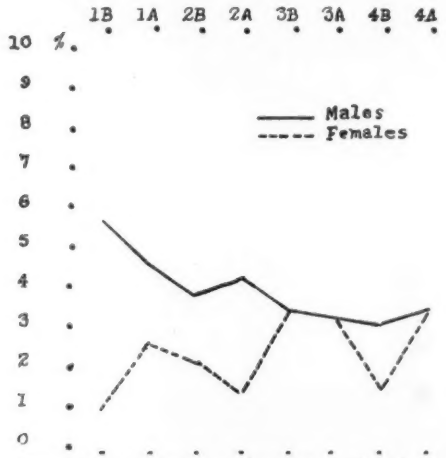

CHART IV. Percentage fluctuation of male and female speech defectives from grade to grade (1).

(1) In relation to those classes only enrolling speech defectives.

decreases from 1B through the 2B, increases slightly for the 2A, then continues downward until the 4A, the female variation follows no such consistency. There is a decided increase from the 1B to the 1A, a slump until the 3B when the figure rises to meet that of the male and follows it through the 3A, falling again to a level comparable to

that of the 2A, then veers sharply upward to again meet the figure of the male.

Defects for both males and females vary greatly as to grades. It is interesting to note that no defect is prevalent as the major speech difficulty for any grade over three times. Indistinctness leads in the 1B, 3A, and 4B, and with the exception of Stammering in the 2B and 4B, no single defect makes more than one appearance in first position. Baby Talk, however, appears second in the 1B and first in the 2A. For females, however, Indistinctness leads in the 1B, 1A, 2B, 2A, 3B, and 3A. Scattered cases are first in the 4B and 4A and second in the 1A and 2B. Stammering appears as a major defect only in the 4B. Comparing both males and females, we find the most re-occurring defects are these: for 1B, 1A and 2B, Indis-

TABLE II

PER CENT OF PUPILS IN EACH GRADE WHO ARE MALE AND FEMALE SPEECH DEFECTIVES*

Grade	Percentage of Male Defectives	Percentage of Female Defectives	Percentage of Male and Female Defectives
1B	5.85%	.83%	6.69%
1A	4.41	2.52	6.94
2B	3.62	2.04	5.61
2A	4.03	1.34	5.38
3B	3.30	3.30	6.70
3A	3.12	3.12	6.25
4B	2.92	1.46	4.39
4A	3.22	3.22	6.45
Mean	3.95	2.20	6.15

*In relation to those classes reporting defects.

tinctness (as one defect); and for 3A, Indistinctness. But, approaching this from a different angle, we find the two leading defects for males and females for all grades. Among the males, Indistinctness overshadows Stammering by a ratio of approximately 3 to 1; the total for all defects amounting to 3.95%. On the other hand, the same ratio holds for Female defects with Indistinctness as the greatest, Stammering and Baby Talk tying for second place.

We have now so limited the field as to say that the two most prevalent defects both among males and females are Indistinctness and Stammering. Table III shows us that the percentage of pupils in each grade vary for Indistinctness from 4.54% in the 3A to a low of 1.34% in the 2A. Stammering, however, varies from 2.69% in the 4A to nil in the 1B. Comparing the two, we find Indistinctness *declining* for the first four grades, increasing for two, then declining

again. Stammering *increases* for the first four grades, then, it declines, increases, declines, increases. Chart V tells the story in a different light. Among males, where Indistinctness declines from the 1B through the 1A, Stammering increases. Both defects increase from the 1A through the 2B (with Stammering at a greater rate), decline from the 2B and the 3B, Indistinctness far surpasses Stammering in the per cent of acceleration; both drop between the 3B and the 3A, and while Stammering drops from the 3A to nil at the 4B, Indistinctness spurts upward, only to drop again at the 4A. Stammering, meantime, jumps from the 4B to a new high at the 4A, far exceeding the record of Indistinctness for the same grade.

TABLE III

PER CENT OF PUPILS IN EACH GRADE AFFLICTED WITH INDISTINCTNESS AND STAMMERING

Grade	Percentage of Cases of Indistinctness	Percentage of Cases of Stammerers*
1B	4.22%	.....
1A	2.20	.95%
2B	1.53	1.53
2A	1.34	1.80
3B	2.23	.55
3A	4.54	1.71
4B	3.41	.49
4A	1.61	2.69

*Includes all cases, whether in combination or not.

As has been shown, Indistinctness predominates as the major defect among females, with Baby Talk and Stammering sharing second place. Chart VI plots these difficulties. In this latter chart note that the fluctuation of Indistinctness through the 3B is similar in variation to that of the same male difficulty, but that while the total drops in the 3A for males, the same grade shows a greater percentage for females. The total then falls rapidly among girls without any grade increases as contrasted to the male spurt to a new high in the 4B. Thus, females show a decided decline from 4.34% in the 1B to .95% in the 2B, a gradual increase, with but one small deviation in the 3B, to 3.88% in the 3A, and a sharp falling to 1.11% in the 4A. The phenomena of Stammering, on the other hand, is comparable in some respects to the male fluctuation. While Indistinctness declined and Stammering increased between the 1B and the 1A for both sexes, the similarity ends here since the defect disappears. In its place springs Baby Talk, assuming in the 2A greater proportions than any other speech difficulty. The percentage drops rapidly to the 3B, increases slightly in the 3A where it is joined in

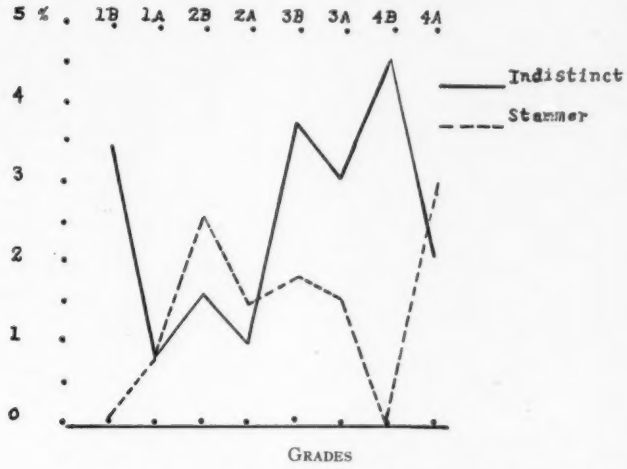

CHART V. Per cent of males with Indistinctness and Stammering in each of the first four grades.

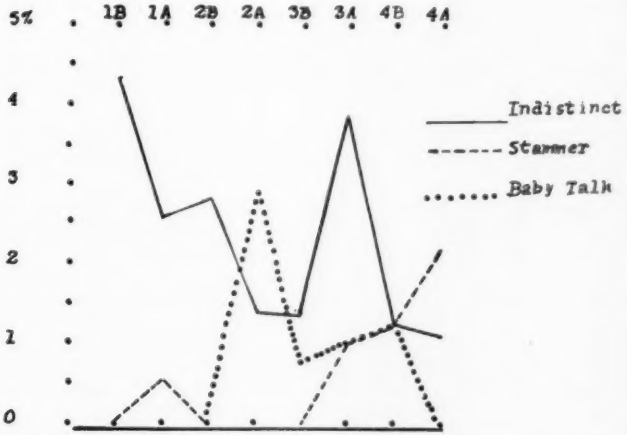

CHART VI. Per cent of females with Indistinctness, Stammering, and Baby Talk in each of the first four grades.

equal percentage by Stammering. Both defects continue their equal increase through the 4B, but by the advent of the 4A, Baby Talk has disappeared, and Stammering has shown a slight decrease.

Assuming that the normal age increase from grade to grade is six months, Chart VII illustrates the variations of both sexes in this relation. One of the most astounding facts of the entire investigation is the average of the 1B female speech defective: *eight and one-half years*. The fact is all the more unusual when we consider that this is the average age for the 3A. However, a re-examination of the raw data reveals only two female sufferers in the 1B. Examination of more schools may increase the percentage of female speech defectives in this first grade and thus reduce the decidedly conspicuous deviation in age. Males, on the other hand, show but slight deviation from the regular aging through the 1A, although thereafter their "over-age-ness" is consistent with only one drop at the 3A. Female

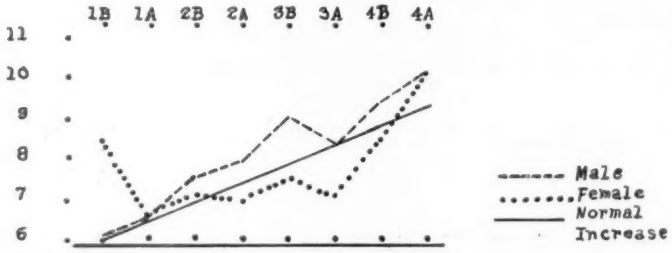

CHART VII. Age deviations of male and female speech defectives compared to normal age advancement from grade to grade.

"over-age-ness" exceeds that of the males for the 1B and 1A, and while the 2B shows females still over-age, their average is under that of the male.

Female age ratings show another surprising thing: from the 2A through the 4B the girl speech defective is *actually under-age*. This tends to dispute the findings of other investigators whose range has been greater than that employed in the present investigation. But, as Chart VII shows, the 3B and the 3A had the largest percentages of female sufferers. In the 4A, however, females again exceeded the males in "over-age-ness" by .06—a small fraction, but significant in that it culminates a straight spurt from the low 7.16 years of the 3A. The general "over-age-ness" of the boys is quite in harmony with the results of practically every speech survey conducted.

Conclusions and Recommendations

That something should be done for the speech defective child goes without saying. Attempts at special training of school children

with speech defects is said to have started in Potsdam, Germany, in 1886, and the movement soon spread throughout that country.[17] Such work was introduced into schools of some of our large cities about 1910, and according to information recently collected, over 80 school systems now employ special teachers of the speech defective. The following cities, comparable in size to Indianapolis, give special attention to the speech defective child:

TABLE IV

CITIES GIVING SPECIAL ATTENTION TO SPEECH DEFECTIVE CHILDREN

State	Population 100,000 and over
California	Los Angeles
	Oakland
	San Francisco
Colorado	Denver
District of Columbia	Washington
Illinois	Chicago
Louisiana	New Orleans
Maryland	Baltimore
Massachusetts	Boston
	Fall River
Michigan	Detroit
	Grand Rapids
Minnesota	Minneapolis
	St. Paul
Nebraska	Omaha
New Jersey	Jersey City
	Newark
	Patterson
New York	Buffalo
	New York City
	Yonkers
Ohio	Cincinnati
	Cleveland
	Columbus
Pennsylvania	Philadelphia
	Reading
Rhode Island	Providence
Texas	Houston
Washington	Seattle
	Spokane
Wisconsin	Milwaukee

Among the largest cities, San Francisco reports seven full-time and sixty-two part-time teachers,[18] and Grand Rapids have five full-time teachers and five who teach for one hour a day. Cleveland has five full-time and sixty part-time teachers.

[17]Rogers, James Frederick. *The Speech Defective School Child.* A study of what our schools are doing for him. Washington, D. C.: United States Department of the Interior, Office of Education. Bulletin, 1931, No. 7, p. 8.

[18]*Ibid.*

Conclusions

1. The actual number of speech problem cases found among 3,602 students in the first four grades of the Indianapolis Public Schools numbered 106 or 2.94%. Since the enrollment of the schools investigated represent approximately one-sixth of the total school population for the same grades, any fair prediction would of necessity be based on the multiplication by six of the actual findings. This would then total what the probable conditions are for the entire system: grades 1—4.

2. Upon the above figures, it is safe to assume that there are between 900 and 1,000 speech defectives in the entire primary-elementary system, grades 1–8. These are in need of corrective or preventive work and include only those with the *most serious* handicaps.

3. Girls show the greatest need in the 3B with the least in the 1B.

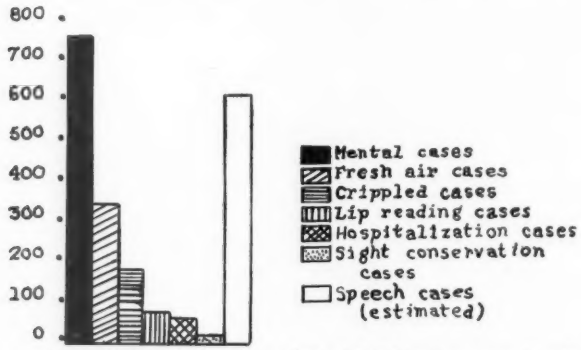

CHART VIII. The number of Special Education cases in relation to predicted number of Speech cases.

4. For the boys, the 1B shows the greatest need, with the 4B showing the least.

5. Indistinctness and stammering are the most prevalent defects among males.

6. Indistinctness, stammering, and baby talk are the most prevalent female defects.

7. Male speech defectives are over-age for the first four grades with the exception of the 3A.

8. Female speech defectives are over-age for the 1B, 1A, and 2B, under-aged through the 4B, and over-aged in 4A.

9. The Indianapolis situation is fairly serious. Chart VIII shows the relation of the estimated number of speech cases in the *first four grades only* to the special education cases handled in the *first eight grades.*

THE USE OF NEGATIVE PRACTICE IN SPEECH THERAPY WITH CHILDREN HANDICAPPED BY CEREBRAL PALSY, ATHETOID TYPE

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Negative practice, as used in this paper, refers to the conscious performance of an undesirable habit pattern in as close an imitation as it is possible to achieve. Its application to speech therapy for the "athetoid" is based upon the assumption that the cortex, or directional portion of the brain, is able to function. The disturbed motion observed in the "athetoid" is evidence of an interference with the normal flow of impulses, but this interference is, supposedly, subcortical in origin. Voluntary movements are possible, but they are misdirected.

The writer has come to believe, after ten (10) years of rather intensive work with children handicapped by cerebral palsy, that the extraneous movements observable in many "athetoids" are of two (2) kinds. First there are what may be called *primary* movements. They are, of the two (2) movements, first in order of chronological appearance and are probably due to the nature of the lesion. They do not resemble the random movements of a growing baby, and must not be confused with these. Primary movements, the writer believes, probably cannot be voluntarily modified. They are, however, absent in many cerebral palsy cases during sleep, and, as Carlson[1] has pointed out, during periods in which the "athetoid" is under the influence of ether anesthetic or alcohol. These primary movements may be rhythmical and fairly continuous or they may appear at unpredictable times and in varied patterns and intensity.

The second group of movements observable in many "athetoids" may be called *secondary* movements. The consistency with which these patterns reappear seems to indicate that they serve or have served a purpose and have become a habit pattern. They appear second chronologically and apparently are not due directly to the lesion per se. They may be voluntarily modified and some may be entirely eliminated voluntarily.

The development of these secondary movements seems to be for a purpose. They may seem purposeless to an observer, and at the particular moment may be purposeless. Their original use, however, seems to have been for a definite purpose. Early in life the "athetoid" may recognize that he has difficulty in expressing himself verbally but he uses the speech muscles as best he can. These move-

[1]Carlson, E. R. Annals of Internal Medicine, Vol. II, No. 2, August, 1937.

ments may be exploratory, and experimental. He may be seeking a way of using his muscles to assist him to adjust through speech. As he grows older his urge to talk makes him increase his effort. Many an "athetoid" has few or no extraneous movements other than the random ones of a growing baby until he begins to make speech attempts. The greater his effort at speech the greater is his muscle tension, and the greater the number of extraneous movements becomes. These extraneous movements vary from child to child and also in a given child in kind, in rapditiy, in vehemence, and in number. For example, during one speech attempt one child uses six (6) extraneous facial movements (blinking eye, squinting eye, raising forehead, frowning, baring teeth, raising one cheek or the other.) At the same time she thrashes her arms above her head and in front of her face, shakes her head rapidly and vehemently, and moves her torso forward and back (feet stationary). Another child raises the right arm to about shoulder height, and waves it. At the same time he wrinkles his forehead, and bends the left arm close to his side. Sometimes these movements are accompanied by raising and lowering of heels or toes in a tapping movement. More patterns are added as the effort increases, but the patterns themselves are the same and appear in practically the same sequences. Practically all, if not all, portions of the body may be involved in any one child. In a fairly flaccid child few extraneous movements are observable during speech attempts, apparently due to the little effort exerted.

Treatment is customarily given to redirect muscles to perform in a prescribed way. For example, the "athetoid" wishes to reach for an object. Perhaps his arm suddenly reaches in another direction. Perhaps by increased effort, resulting in increased tension, tremor and number of extraneous movements, he does eventually reach his goal. Treatment is also usually given to accomplish relaxation of specific parts, as arm and shoulder. After relaxation is fairly easily done, passive, then, guided, active treatment is given to enable him to reach for the stated object. The child assisted and unassisted reaches until he can reach. Conscious effort may or may not be made to straighten an elbow or open or close fingers and so forth. He tries to relax and then, with minimum effort, keeping his eyes on the object, he reaches for it.

In speech treatment emphasis is usually also upon how certain muscles should function but with no recognition on the child's part of why they don't function in the prescribed manner. His efforts are constantly frustrated. The more he tries the more tension appears. If he takes time to relax in every speech situation the psychological need for speech may be removed. Some one else says what he wants to say or moves away before he is ready.[2]

The treatment involving negative practice outlined below includes relaxation and voluntary movements. It goes further; a thorough

[2]The writer does not minimize the importance of relaxation in the treatment (speech or physical) of cerebral palsy. The reader will observe that mental relaxation, which precedes physical relaxation, is a subtle factor in accomplishing negative practice.

understanding by the child of his extraneous movements and the ability to manipulate his muscles to eliminate the undesirable habit patterns, thereby making way for desirable habit patterns, are the aims of treatment through negative practice.

The physiological relation of extraneous movements to poor speech is quite apparent. The discharge of nervous energy into the channels which operate the muscles involved is continuous or nearly so during speech (including internal speech and thinking). Not only is it continuous (or nearly so) but frequently it is excessive in nature. This tremendous amount of energy should be conserved and used in producing easy, effortless speech.

Besides the physiological significance there is the psychological. Speech in a broad sense is a social activity. Extraneous, bizarre, unrelated movements tend to detract from a pleasing personal appearance. As a result the child may feel insecure, frustrated, inferior, and frequently be very unhappy as a result.

To aid these "athetoid" children to reduce or eliminate their extraneous movements, the negative practice technique described in the following pages has been used at Dowling School for Crippled Children of Minneapolis, with considerable success, with an increasing number of children. It is offered not as a cure all, but with the hope that its value to speech and physical therapy may be recognized and applied. The reduction and elimination of extraneous movements, in the writer's opinion, (1940) should assist children handicapped by cerebral palsy to make a more satisfactory adjustment to life.

Preceding the actual "extraneous movement" study the speech clinician should gain the child's confidence and co-operation. This step is essential to ensure later success. The length of time devoted to accomplishing the desired result will vary depending upon both child and clinician. The method enployed to gain the child's confidence and co-operation will also depend upon both clinician and child.

Besides his confidence in the speech clinician, the child must have confidence in himself. He must understand that many of the extraneous movements he feels and sees are ones he has set up and which he must and can now eliminate. He should know that some of the movements may persist but all of them need not. The steps employed in the method of negative practice used by the writer are: Identification, Recognition, Attack of Purpose, Analysis, Imitation and Application.

(1) **Identification**

In order to eliminate or change undesirable habit patterns the child must know what he does that is undesirable. To accomplish this end he sits before a mirror many minutes each day, studying his movements. Definite instruction should be given such as, "watch your face as you talk for three minutes. Tell me all the movements you see." As the child mentions what he sees the speech clinician makes note of them for later use of the child. The clinician should, of course, amplify the list to include his or her own observations for his

or her own study. The child is more free to observe if he is not required to write his findings. However, he should have access to his own observations as recorded by the clinician. He should also be led to identify more and more inclusively.

Caution should be used by the speech clinician in the length and frequency of the observation periods. It may be a shock to some children to realize how grotesque their movements are. Others may be quite unaware that they have any unnecessary movements. Each child must be prepared for the study and not plunged into it purposelessly. The speech clinician may need to suggest that a certain movement present is an unnecessary one. One boy of nine "caught on" only after he was shown that "fighting" against some of the involuntary movements occasioned by his condition caused unnecessary movements. In his fighting against the involuntary "pulls" he threw his body from side to side, frowned, and distorted his face. Frequency and duration of observation periods should be continued at the discretion of the speech clinician until the child has discovered and reduced or eliminated all undesirable habit patterns. Observations are frequently made at most unexpected times. As the child is working on one certain movement he may observe others which he has not previously noticed. He may come to work one day still thrilled because he discovered an undesirable movement while working at home.

Confusion and apprehension may be averted and interest sustained if the next step is begun after two or three of the extraneous movements have been discovered. The first movement chosen for reduction or elimination should be one that seems as if it would yield easily. If it proves to be one that is difficult to eliminate it should be dropped temporarily.

(2) **Recognition**

Identification of a movement once does not insure its recognition at other times. Visual identification should be followed by kinaesthetic recognition. The child must be aware of the particular movement whenever it occurs if he is going to eliminate it permanently. He must become very familiar with it. Various devices may be used to help him to be aware of the frequency with which he uses a specific movement. For example, as her head dropped to her chest one little child laughingly said, "Bingo! there goes my head." Thereupon the expression "Bingo!" became the key word in expressing the recognition of the plopping down of the head. Sometimes she added, "There it goes again." Sometimes the plops were in such rapid succession that she had time for only "Bingo." Much merriment resulted from the use of this device. Children's own expressions are frequently much more appropriate than any an adult may attach to the situation. One little girl of 6 rolled her eyes and said, "Oh, Oh!" (in the mode of the day) each time one of her facial grimaces appeared. The point in this step is the child's awareness, visually and kinaesthetically, of the undersiable habit pattern. No emotional tone should become attached to any movement. An objective attitude

on the part of both child and clinician should make it possible to avoid any undesirable attitude from developing.

(3) **Attack of Purpose**

After recognition begins to be rather keen the child should begin to discover whether or not the movement is of worth. Self addressed questions are of value at this stage. They should follow the line of the "Why" questions: "Why do I raise my one eyebrow?" "Why do I wave my hand and arm?" "Is it of any value to me?" The child should understand that some movements are desirable. He should learn to discriminate between necessary and unnecessary movements. As far as he is able to, he should learn that some extraneous movements probably were of temporary value at one time. As their usefulness disappeared they were masked by others, equally useful, temporarily. The permanent value of any one of these movements should be considered. Care should be exercised to avoid substituting one undesirable temporary habit pattern for another. If the question of purpose is kept in mind such a pitfall should be avoided. When the movement under scrutiny is considered for elimination, the next step is the analysis of it.

(4) **Analysis**

This step seeks to know the "How." It involves the rather detailed "look" and "feel" of the movement. Because it is easier to become familiar with how a certain act looks, the movement is analyzed from the visual point of view first. The procedure may be followed through from beginning in some such manner as this: (1) "I frown, (2) bare my teeth, (3) pull my lips into a grin, and (4) throw my head as I say words with "S" sound in them; or (1) "As I talk my head keeps jerking up, (2) I pull my upper lip into a tight wad and (3) I keep squinting and winking my left eye." The foregoing are examples of advanced analysis by seventh and eighth grade children. Younger children tend to see one part at a time. This final analysis by looks is the result of careful questioning and commenting by the speech clinician. Usually a number of periods are necessary to get a fairly complete picture. The fact that all the movements are not present at every given time complicates the situation.

Kinaesthetic analysis follows visual analysis. Several leading questions may start the child thinking about the "feel" of the movements. "Where do you feel it when (your arm raises), (your head plops), etc.?" "Where is the pull?" It is frequently helpful to the child if the clinician touches the part of the body named by the child. Sometimes the place he names is not the point at which he actually feels the movement. It is essential that he is aware of the location of the "pull." He soon can discriminate between extraneous, controllable movements and those which will probably be permanently involuntary.

This step is an essential one for upon his ability to feel the pull into the undesirable movements depends the child's success in mastering the next step.

(5) **Imitation**

As soon as the child seems to see and feel the undesirable habit pattern, he is asked to imitate it as closely as he can. The questions kept before him are, "Does that movement look like that when you aren't trying to make it?" or "Does it feel the same now?" "Do you feel the same pull?" Gradually he may be brought to imitate (or fake) so well that even the clinician can be fooled.

At this point the child should have as his goal the desire to gain the ability to "turn off or on" any given movement or movements. Each habit pattern is brought through this state singly. Time, patience, and kindly made suggestions are three factors to be contributed by the clinician. The child must have patience, sense of humor, insight into the problem, and a desire to achieve. He must not be hurried, nor feel any tenseness in any one working with him.

(6) **Application**

After the child begins to be able to imitate fairly successfully he should be given plenty of practice in "turning off and on" each habit pattern he wants to eliminate. Practice of this sort gives him a voluntary control and gradually the old habit is modified and perhaps eventually eliminated.

The application procedure for speech therapy needs to be definite, defined, and simple, for example: Lift your left arm, and wiggle your fingers (an old habit pattern). *Then* say "Hello." The child must understand he is to keep to the letter of the assignment—no more, no less, no variation. Complexity of assignments should increase as ability to control increases; for example: "*As* you raise your left arm, wiggle your fingers and say 'How are you'?" Later, reading can be utilized in the following manner. The child may read one sentence using a given movement in a specified place; as he reads the next sentence he eliminates the movement; the succeeding sentences in a specified selection are alternated with and without specified movement. Conversation may likewise be utilized. The clinician must be alert to the danger of substitution of some other undesirable habit pattern. The child must recognize this danger also, and be on the alert to avoid building up equally undesirable habits in his effort to eliminate the ones he already possesses. Finally in the application of negative practice is the recognition by the child of the ease and joy in movements when unaccompanied by the excessive effort he formerly used.

It should be recognized by any person undertaking negative practice with "athetoid" children that there may be extraneous movements in some children which may not be reached by a voluntary control method. Nor may every child so affected be reached. The writer repeats that this is not a cure all, nor is it infallible. Its success depends upon child, clinician and the careful use of the steps involved.

A QUALITATIVE STUDY OF THE ORGANIC SPEECH MECHANISM ABNORMALITIES ASSOCIATED WITH CLEFT PALATE[1]

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The general purpose of this study was to determine the nature of abnormalities of the speech mechanism which may be associated with cleft palate. The most common abnormality of the kind is, of course, harelip. Although other abnormalities may be associated with this condition, such deviations as may affect speech have not been demonstrated in the literature available to the authors.

A survey of the speech correction literature revealed that many speech clinicians apparently operate on the assumption that the malfunctioning of the soft palate to the exclusion of nearly all other factors is responsible for post-operative cleft palate speech. On the other hand a review of the medical literature disclosed a number of references to defects of the oral, nasal, or pharyngeal areas in the descriptions of certain cleft palate cases. Casual observations of speech correctionists seemed to substantiate the conclusion that in at least some cases other anomalies of the speech mechanism accompany cleft palate.

The present study was exploratory in nature. Its specific purposes were to discover: 1, whether other speech mechanism abnormalities are present in most cleft palate cases; 2, whether any such associated abnormalities could be considered to affect speech adversely.

It was thought that such a study might contribute both to an understanding of causes and to the improvement of the therapy of cleft palate speech.

The sampling consisted of 33 cleft palate cases; 18 males and 15 females with an age range of six to 42 years. All were post-operative cases except one; the mean number of operations was three. The Ritchie-Davis method of classifying the type of cleft was used. Twenty-four cases out of the 33 belonged to Group III which represents those with a cleft of the alveolar process; the remaining nine were of Group II classification meaning post-alveolar clefts.

An examination of the peripheral speech structures was made. Each anatomic part was described in detail on a blank prepared for the purpose. Any abnormality found was rated on a three point scale as to the likelihood that the condition might affect speech adversely. A rating of one was given if, in the opinion of the examiner, the particular abnormal condition would have no apparent

[1]This study is a part of the University of Minnesota Speech Clinic program of research under the direction of Professor Bryng Bryngelson.

adverse effect on speech; a rating of two, if the abnormality would have a possible adverse effect on speech; and three, if it would almost certainly affect speech adversely.

Speech examinations were available on some of the cases; an analysis of the speech of some of the others was made by the examiner. The speech abnormalities exhibited by a case were compared then with any abnormalities in the speech mechanism.

Table I shows ratings for size and activity of some of the structures separately. This was the procedure used in the preliminary stages of rating structures. Actually, the examination blank contained subdivisions other than size and activity which were described as well as rated under the heading of any one structure.

For instance, nasal examination involved the observation of seven conditions to be described and rated; two of which are shown here.

These data showed that the nasal passages are sometimes partially clogged; and in those cases with a complete cleft of the lip, which usually signified a cleft of the alveolar process, there were nearly always such abnormalities as deflected alae, flattened nares, deviated septum, deformed philtrum, and mouth breathing. Information on nasal conditions such as infections, enlarged turbinates, sinusitis, etc., was obtained from medical records or from interview with the doctor. It was found that 75 per cent of the cases had one or more nasal conditions judged to have a possible adverse effect on speech.

The first structure observed in each case was the lips. The length of the upper labial frenum and the size of the lip were recorded if regarded as abnormal. The activity of the lips was tested by requesting the subject to say ee-oo. The experimenter spoke the sounds exaggerating her lip position and then signalled for the subject to imitate her. Throughout the examination whenever the subject spoke, the lip activity was watched. The behavior of both lips was recorded as good or poor. The word *lip* here refers to the vermillion border. It will be seen from the table that ten cases received a rating of two or possible adverse effect on speech, and 15 cases, a rating of three or almost certain adverse effect on speech of size of lip structure. That means that 25 cases or about three-fourths of the sample had deviations in size of lips which could be considered to affect speech adversely.

The second structure noted was the tongue. The size and condition was judged and recorded. Any abnormality of the frenum was noted; and the motility and flexibility of the tongue were tested. The activity of the tongue was such in 12 cases that it was considered to have a possible adverse effect on speech, and an almost certain effect in two cases. This means that in slightly less than half the cases the condition of the tongue was judged to have an adverse speech effect.

The condition of the teeth was described by the amount of decay, dental work, type of occlusion, gaps in the teeth, and missing and short teeth. Gaps in the teeth of 29 of the cases were of such a nature as to receive ratings of two or possible adverse effect on speech. This would be about seven-eighths of the cases. Although it is not shown here, in 14 cases there was sufficient degree of mal-

occlusion to warrant ratings of three and an equal number of cases received ratings of two; or in 28 cases altogether malocclusion was held to have an adverse effect on speech.

The size of the jaw was observed and described; the relative sizes of the dental arches, the development of the maxilla, the protrusion or retrusion of the mandible were considered. The activity of the jaws was tested and was described as being easy or effortful,

TABLE I

NUMBER OF CASES HAVING RATINGS OF 2 AND 3 FOR SIZE, ACTIVITY, CONDITION, ETC., OF VARIOUS STRUCTURES

	N Cases with Ratings	
	2	*3*
LIPS:		
Size	10	15
Activity	16	2
TONGUE		
Size	6	2
Activity	12	2
VELUM		
Size	13	13
Activity	9	11
TEETH		
Gaps	29	1
Short Teeth	12	0
FAUCIAL ARCH		
Size	18	6
Activity	7	10
JAW		
Activity	10	1
Malrelation of Jaws	22	2
PHARYNX		
Condition	12	0
Activity	15	8
UVULA		
Condition	25	0
Size	7	0
HARD PALATE		
Height	7	0
Condition	7	0
NOSE		
Nares	23	0
Alae	22	0

partial or normal. In 24 cases the malrelation of the jaws was thought to be an adverse influence on speech, two of which would almost certainly have an adverse effect.

An examination of the hard palate revealed abnormalities in height and abnormal conditions which included scar tissue, holes in palate, differences in epithelium and in textures of membranes. Abnormal height of palate was judged to have a possible effect on speech in seven cases, and condition also received a rating of two in seven cases. No matter how great the abnormality of the hard palate, the examiner did not believe that she was justified in considering it to have any more than a possible effect on speech. The same was true of the uvula and of nasal conditions.

The uvula was described as to size and condition. In 25 cases the condition of the uvula was thought to have a possible adverse effect on speech. Three-fourths of the group, then, were found to have abnormalities of the uvula of a significant nature in respect to speech.

The condition of the pharynx was described including inflammation, granulation, post nasal drip, and activity. Medical records were used here when necessary. Pharyngeal condition was judged to have a possible adverse effect on speech in 12 cases, while abnormalities in activity were found to be important in relation to speech in 23 of the cases.

The faucial arch was described according to size and the activity of the pillars of fauces were observed during phonation. In 18 cases the faucial arch was thought to be such as to have a possible adverse effect on speech; and in six cases it was thought almost certainly to affect speech adversely. In 24 cases out of the 33, then, the condition of the faucial arch may be said to be a factor in their speech. In four cases an unusual condition of the pillars of fauces received a rating of two.

Of especial interest are the preliminary ratings on soft palate. This structure was described as to size, activity, and approximate distance from meso-pharynx. In 13 cases the size was considered to be abnormal enough to have a possible adverse effect on speech; in 13 others, abnormal to the extent of almost certainly affecting speech adversely. It should be pointed out that in only 11 cases out of 33 was the activity of the soft palate such that it would, in the opinion of the examiner, almost certainly affect speech adversely. None of the aspects of soft palate structure or functioning constituted a problem in every case.

In the majority of cases in this sample the most severe deformities of the oral cavity associated with cleft palate were severe malocclusions of every type, irregular teeth conditions, and inadequate motility and flexibility of the tongue. The kind and severity of abnormalities were quite different in different cases as can be seen from these preliminary ratings.

Table II shows the final ratings given each abnormal structure; included in the list of structures were a few conditions of structures such as malocclusion and malrelation of jaws because they were considered important enough to rate separately. With this exception each case received only one rating per structure in the final analysis.

An examination of this table reveals that the number of structures rated three for each subject ranged from one to eight, and the number of structures rated two ranged from five to 18. All 33 cases are plotted here. It is illuminating that every case had some abnormality in addition to the cleft palate considered severe enough to have a possible adverse effect on speech; not a single case was without at least five structures rated two.

Only four cases had no structures rated three, and these cases had from seven to 15 structures rated two or possible effect on speech. Six cases having one structure each with an almost certain adverse effect on speech had from five to 18 structures with a possible

adverse effect on speech. Seven cases, with two structures each having a three rating, had from seven to 14 structures with a two rating. The number of cases having 14 or more ratings of two is 11 or one-third of the sample; while eight cases or less than one-fourth of the sample had fewer than nine structures rated two.

One case had as many as eight parts judged to have an almost certain effect on speech and ten judged as having a possible adverse effect.

It will be noticed that two cases had five structures rated three, four cases had six with the same rating, and one case had eight so rated, making seven cases or about 21 per cent had five or more structures rated as having an almost certain adverse effect on speech.

The incidence and severity of speech mechanism abnormalities found in this series is striking when one considers that the median case had two structures rated as having almost certain adverse effect on speech and twelve structures with a possible adverse effect on speech.

TABLE II

PLOT SHOWING NUMBER OF STRUCTURES RATED 2 AND 3 FOR EACH INDIVIDUAL

Rating of 2 (Probable Adverse Effect on Speech)	Rating of 3 (Almost Certain Adverse Effect on Speech)								
	0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
0	...	...	...	...	...	...	...	...	...
1	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...
5	...	1	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...
7	1	...	1	1	...	...	...	...	...
8	...	...	1	2	...	...	1	...	...
9	...	...	...	1	...	...	...	...	...
10	...	...	...	...	...	...	...	...	1
11	...	3	1	1	...	...	...	...	...
12	...	...	1	...	1	...	2	...	...
13	1	...	2	...	...	...	...	...	...
14	1	...	1	...	1	1	1	...	...
15	1	...	...	1	1	...	...	...	...
16	...	1	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...
18	...	1	...	...	...	1	...	...	...

Table III shows the number and per cent of subjects having various numbers of structures rated two and three, and expresses in a different way the data of the last table.

Of the ratings of almost certain adverse effect on speech, 21 per cent of the sample had two structures so rated, 18 per cent had three and nine per cent, four. Almost half of the 33 cases had three or more structures judged to have an almost certain adverse effect on speech.

Of the abnormal structures or conditions rated two, it is seen from the table that 15 per cent of the sample had 12 structures so rated, 15 per cent had 11, and 15 per cent had 14, 12 per cent of the sample received ratings of possible adverse effect on speech on eight structures.

To summarize this table, 88 per cent of the subjects had one or more structures having an almost certain adverse effect on speech; and all of the subjects had five or more structures having a possible adverse effect on speech.

The comparison of type of speech with various anomalies found in each case seemed to show a logical relationship; that is, the defective sounds and the peculiarities of voice of any one case seemed a natural product of the particular deformities of his speech mechanism as nearly as could be determined. That is as much as can be said about this part of the study since such a relationship must be highly conjectural in view of our present knowledge of Phonetics, and since comparable information on individuals with normal speech was not available.

TABLE III

NUMBER AND PER CENT OF CASES HAVING VARYING NUMBERS OF STRUCTURES RATED AS 2 AND 3

		Number of Structures								
Rating	Cases	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
3 Certain	No.	4	6	7	6	3	2	4	....	1
	%	12.12	18.18	21.21	18.18	9.09	6.06	12.12	....	3.03
2 Possible	No.	....	....	....	....	....	1	....	3	4
	%	....	....	....	....	....	3.03	....	9.09	12.12

		Number of Structures									
Rating	Cases	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*
3 Certain	No.	....	....	....	....	....	....	....	....	....	....
	%	....	....	....	....	....	....	....	....	....	....
2 Possible	No.	1	1	5	5	3	5	3	1	....	1
	%	3.03	3.03	15.15	15.15	9.09	15.15	9.09	3.03	....	3.03

Median number of structures rated 3 is 2.
Median number of structures rated 2 is 12.

In summary, this study demonstrates that abnormalities of other peripheral speech structures than the palate are found in individuals with clefts of the palate; and it has indicated to what extent it may be conjectured that such abnormalities affect the speech of these individuals adversely. The present study does not demonstrate that persons without cleft palate do not have similar abnormalities. In that sense then it is not definitive. General observations however would indicate that non-cleft palate cases have fewer such abnormalities. It is suggestive therefore that a comparable study of randomly selected speakers be made in order to quantify these differences. The general implications of the study are that if such research reveals non-palatal abnormalities to accompany clefts of the palate with some regularity, that these conditions should be considered in such therapeutic measures as are given to the speech of the cleft palate individual.

THE MOTO-KINAESTHETIC METHOD APPLIED TO APHASICS

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From hospital records it would seem highly probable that nearly forty per cent of our mortalities are accompanied by an aphasic condition. In other words, nearly forty per cent of the combined men, women and children of today will reach a time in life when normal speech will either be disturbed or completely incapacitated by paralysis, or by destruction of vital portions of the central nervous system. Considered in this light aphasia becomes less intangible, less a diagnostic term and more a vital issue.

Primarily, aphasia must not be looked upon solely as a result of old age and therefore an inevitable evil. With the rate of accidents increasing, injuries ever prevalent, disease an insidious menace, and the horrors of war only begun, aphasia and kindred calamities assume lamentable proportions.

Hydrotherapy and countless other methods of medication may restore injured muscles and limbs of some aphasics, but in most instances will fail in themselves to rehabilitate speech. Undoubtedly it is true that the revitalizing of the gross musculature in the cases of hemiplegia and other types of paralysis is stimulating to the finer muscles required in adjusting the speech mechanism, but this stimulation can very often be greatly facilitated, if not completely re-awakened, by moto-kinaesthetic re-education.

That muscle rehabilitation alone is not sufficient to restore speech in all cases is proved by the following experience. Only recently in our clinic we have been working with a highly skilled mechanic employed at one of our largest aeroplane factories in the west. Despite three years of speechlessness following the removal of a tumor over Broca's area this man has been able to perform the important tasks required, and at the same time make his desires fairly obvious through signs. In spite of the fact that this man was constantly exposed to speech and had the urgent desire to talk, he was unable to accomplish the feat unaided. When asked his name, he could with great difficulty and much spasmodic movement of the mouth and tongue make sounds which were practically unintelligible. On two words, "no" and "sure," he constantly perseverated; other than this there was little but jargon speech.

A medical abstract of the case given by Dr. J. M. Nielsen, one of the leading specialists in aphasia is inserted at this point to illustrate the psychic and physical changes that took place in the individual.

Abstract on case of G. S.:

Mr. S. first came to me at the age of forty-five with the history that he had been perfectly well until the age of forty-three when, out of a clear sky, he had an epileptiform seizure at his place of employment. He consulted a physician who did not make a diagnosis but prescribed luminal. After he had taken this for a short time without having any more attacks, he ceased taking the medicine and then suddenly had two attacks on the same day. Without again consulting his physician he answered an advertisement in the paper whereby he received from Chicago some medicine (which also contained luminal) and continued to take this steadily for two years. He had no further epileptiform seizures during that time, but he lost his memory so that he could not work and seemed to be getting a great deal worse.

Examination at this time showed that he had difficulty in finding his words and often said the wrong word. In attempting to write, he even wrote the wrong words so that he had written paraphasia (paragraphia). Examination showed that he had considerable weakness of the right side of the face, had no other language disturbance except what was mentioned above, but had signs of increased intracranial pressure and positive pathological reflexes on the right side. The deep reflexes were also increased on the right and there was a marked change of personality. He had become impossible to live with, was disagreeable, uncouth, untidy, and abusive to his family. The pathologic reflexes were of the type which indicated a frontal lesion and the physical findings associated with the changes of personality established the diagnosis of tumor of the frontal lobe. He was sent to the Los Angeles General Hospital where Dr. Raney removed a tumor between the skull and the brain over the left frontal lobe. The patient lost all his signs and symptoms, had no further epileptic seizures, although of course he did not take luminal any more, but he did not learn to speak again.

J. M. NIELSEN, M. D.

When this patient was first admitted to the clinic and was asked to repeat words, he made futile attempts to adjust the speech muscles for correct utterance, but instead the movement became chaotic and eventually was as completely blocked as in cases of the most severe stammering. From this it seemed evident that the case needed directed patterns of movement to co-ordinate muscles and produce correct adjustments. Here apparently the purely visual stimuli were not sufficient for the subject to duplicate the functions he saw performed by other mouths, likewise the auditory stimuli were inadequate to inspire accurate imitation.

A weakened motor speech area flooded with visual and auditory stimuli, and struggling with conflicting learned, but inco-ordinate patterns of muscle movement, responded readily to the accurate manual direction that guided speech sounds into words. Where complete blocking and chaotic sounds had previously existed, there once again developed the natural and precise release of the tongue and lips characteristic of normal speech. The only serious problem that developed with this patient was that in his newly gained confidence he tended to anticipate corrective manipulation, and only then did he revert to manifestations of his previous blocking. However, release could immediately be secured by the patient or the clinician through moto-kinaesthetic stimulation; with the corrected pattern thus repeatedly set the conflict continued to disappear.

If the reader is interested in a detailed description of the moto-kinaesthetic methods, which can only be treated cursorily here, he is referred to a book entitled: *Children with Delayed or Defective Speech*,[1] by Dr. Sara Stinchfield Hawk and Mrs. Edna Hill Young, or to a forthcoming manual compiled by Dr. Lee Edward Travis and Professor Eugene Hahn. The suggestions contained in these two volumes will be most helpful in treating not only aphasics but all other types of speech disorders involving neuro-muscular maladjustments.

It may be that from the standpoint of a physician the case previously cited does not present as severe involvements as one usually finds in aphasic patients; so I will briefly summarize the procedure observed in two other instances. A young man of nineteen with a large tumor over Broca's area underwent surgery and emerged with complete amnesia aphasia, agraphia and alexia. Upon recovery he apparently understood all that was happening about him, but finding himself incapable of making his wants known he became irritable and finally gave vent to violent outbursts of temper. Eventually it was deemed necessary to confine him to the psychopathic ward, and it was from here that word reached us at the college that help was needed.

When treatment was first undertaken, work periods had of necessity to be very brief, for the patient tired easily. But there was apparently such an overwhelming desire to regain lost abilities that when therapeutic measures were taken, temper seizures subsided and the patient's whole mental attidude began to return to normalcy. Easy manual tasks were introduced to give confidence, while visual and auditory aids were used to accompany the moto-kinaesthetic rehabilitation. In six months this boy was released as completely normal, and has for the past year been actively employed in a position of utmost responsibility.

But there is still another type of case which is much more common, especially among the middle-aged. I refer particularly to those patients who, because of brain hemorrhage, are frequently left not only aphasic, but also paralytic. There are unfortunately too many thousands of these convalescents vegetating in homes and hospitals when a slight amount of re-education could help many of them to gain a much more normal status. With the constant plea for more and more speech aid, it is obvious that we cannot over-emphasize our corrective assistance to the youth of the country, while others equally needy are left to receive little or no aid. One need not dwell upon this, for every clinician is already aware of the lamentable neglect. However, it would seem imperative that in our rapid expansion of remedial speech, each clinic make some efforts toward incorporating assistance for such types of rehabilitation.

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[1]Hawk, Sara Stinchfield, and Young, Edna Hill. *Children with Delayed or Defective Speech.* California: Stanford University Press, 1938.

Again for the sake of clarity I cite an example of a Navy flier who after fifteen years of service was surveyed from active duty when a stroke produced complete right hemiplegia. In succession three other hemorrhages left him a victim of transcortical motor aphasia, agraphia and alexia; the whole speech area was apparently completely involved, yet he rallied under treatment and is now making rapid strides toward the recovery of his lost functions.

These instances have dealt with men all of whom were under forty-five years of age, and therefore more responsive to therapeutic measures, but the same procedures have wrought just as spontaneous results with older patients, provided the uninjured brain cells were active enough to respond, and that destruction had not occurred to similar areas in both halves of the brain.

Therefore, in view of this elementary experimental work we are doing, we are led to believe that crippled bodies need not always house crippled speech.

SOUNDS THE LETTERS MAKE. By LUCILLE D. SCHOOLFIELD AND JOSEPHINE B. TIMBERLAKE. Little Brown and Company, Boston, 1940. 47 pp. Profusely illustrated.

AN ALPHABET BOOK FOR BETTER SPEECH AND BETTER READING, is the sub-title the authors have given to this unusually fine text which should be in the hands of every little child capable of reading or just learning to read. In the foreword, they also state:

"Many children readily recognize a dog by its bark, a cat by its mew, a bird by its song. Yet often those same children have not developed the finer powers of discrimination, and seem bewildered when first attempting to associate letters and their sounds.

Here are offered rhymes and pictures that make it easy to identify the sounds of speech and the letters that represent them. The association of vowel sounds with the names of children catches the child's attention and stimulates his memory. Through the repetition of the rhymes and the emphasis on the recurring sounds, the child hitherto *auditorially unobservant* often becomes sound conscious, and consequently learns to speak, read, and spell more easily."

A typical example of their method of treatment may be seen in the following extract on what is sometimes called the "A" sound.

ABIE'S A

First we'll learn one sound of A.
Can you hear it as you say,
"Abie has the tummy ache,
Too much ice cream, too much cake.
Abie has a pain inside;
Stayed away from school and cried."
Read this rhyme and find each way
You can write this sound of A.

A few questions should elicit the observation that several spellings occur for the A sound, and also make clear what they are.

A STUDY OF THE RESPIRATION OF FOURTEEN SPASTIC PARALYSIS CASES DURING SILENCE AND SPEECH

HENRIETTA C. HULL
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The experimental approach to the study of spastic paralysis lies partially within the realm of speech pathology because of the impaired speech characteristic of the majority of such cases. Speech therapy is handicapped because little information as to the functioning of any part of the speech mechanism of the spastic is available. Therefore a study performed for the purpose of defining the functioning of any part of the speech apparatus should be of interest to the speech pathologist.

The breathing characteristics of spastic have not been defined by research. However, breathing studies have been made on other speech defectives and on normal speakers. Previous literature on the characteristics of normal breathing is referred to in comparing the characteristics of spastic breathing as determined in this study.

The purpose of this study is to determine whether or not breathing abnormalities characterize the spastic during silence or speech, and to determine the effect of complexity of speech upon respiration. Are there any consistent breathing patterns of the spastic which deviate from the normal? If so, do these breathing patterns show a greater deviation during speech than during silence? This study is an attempt to give some answers to questions such as these.

Breathing records were obtained on the following activities for the fourteen subjects: (1) silent breathing; (2) silent reading; (3) whispered "ahs"; (4) prolonged "ah"; (5) vocalized "ahs"; (6) reading non-contextual material aloud; (7) reading a story aloud; and (8) propositional speech.

These activities were selected in an attempt to answer such questions as: (1) Does the ordinary quiet breathing of spastics show peculiarities? (2) Does silent reading alter the breathing? (3) Do phonation and whispering differ in their effects on breathing? (4) What are the effects of breathing of controlled and progressive relaxation of the thorax as compared with a series of short relaxations? (5) Is the breathing pattern during the reading of contextual material different from that during reading of non-contextual material? (6) Do proportional speech and oral reading differ in their effects on breathing? An attempt is made to answer these questions.

The fourteen spastic paralysis cases who served as subjects in this study were pupils attending the Michael Dowling School for

Crippled Children in Minneapolis during the summer session of 1938. There were four males and ten females ranging in age from ten to sixteen. Eleven of the subjects were diagnosed as cerebral palsy, extrapyramidal type, two as spastic diplegia, and one as spastic paraplegia.

The apparatus used in this study consisted of a Sumner pneumograph, a Marcy tambour, and a Renshaw polygraph.

Measurements were made of duration of thoracic expansion, contraction, and maintenance as recorded by the apparatus. In order to express the characteristics of the breathing of spastics for comparison with the breathing of normal speakers I-fractions were computed. The I-fraction being defined by Woodworth as the duration of inspiration divided by the duration of the whole cycle. Vossler's norms for normal speakers during silence and speech were used as a basis for comparison.

One of the deviating characteristics found in spastic breathing was an unusual amount of thoracic expansion during speech. In order to check the possibility of abdominal compensation as an explanation for this phenomenon the unusual amount of thoracic expansion during speech the following experimental check was performed. Simultaneous recording of thoracic and abdominal breathing was made on seven of the fourteen subjects. Those activities in which thoracic expansion occurred during speech were repeated, and simultaneous thoracic and abdominal breathing records were made.

From a study of the data obtained from thoracic breathing records of these fourteen spastic paralysis cases, the following conclusions were drawn: (1) the breathing of spastics deviates from that of normal speakers; (2) speech activity increases the breathing anomalies; (3) the present data do not show that the respiratory abnormality is effected by varying the complexity of speech activities; (4) there is an unusual amount of thoracic expansion during spastic speech; (5) in spastic breathing the position of the thorax is maintained during an abnormally long part of the respiratory cycle; (6) thoracic and abdominal opposition occur during both silent and speech breathing; (7) thoracic expansion during speech may be at least partially explained by abdominal compensation.

The practical value of this study is that some of the malfunctioning of the spastic's breathing is defined and partially explained. The field of research on spastic paralysis has only been opened. Speech pathologists need to know much more about spastics before speech training with them will be adequate.

A QUANTITATIVE STUDY OF THE SPECIFIC PHENOMENA OBSERVED IN STUTTERING

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I. Introduction

This study was done at the Speech Clinic, State University of Iowa. In it an attempt is made to describe stuttering in accordance with the formulation that the describing process involves enumeration of relatively highly differentiated phenomena, determination of the relative frequency of occurrence of the specific phenomena (considered separately), and, determination of the relative frequency of occurrence of specified combinations or groups of these phenomena. It is designed to contribute toward a more adequate description of the moments of stuttering. The assumption is made that in the final analysis the validity and the practical value of any theory of stuttering must depend upon the degree to which it represents symbolically, not "stuttering," but *stutterings*—the events observable during those discreet moments of behavior which are regarded as examples of stuttering.

II. Problem

The problem can best be stated in the following specific questions:

1. What types of specific phenomena occur during the moments of stuttering?
2. In what proportion of N moments of stuttering, presented by a given stutterer, does each phenomenon occur?
3. To what degree are individual differences among stutterers to be observed in this respect?
4. To what degree is it true that a given stutterer presents a consistent "pattern" of stuttering?
5. To what degree are individual differences among stutterers to be observed in this respect?
6. To what degree do the observations made without apparatus agree with the observations made with apparatus?

III. Materials Subjects, and Procedure

A check-list was made up of phenomena mentioned by Travis (5), Snidecor (4), West (6), Johnson (2), and Bryngelson (1), and from observations of stutterers receiving remedial instruction at the State University of Iowa. Additional space was allowed at the bottom of the list for other phenomena which might occur. The apparatus used to record the mechanical observations included a polygraph, a timing device on the polygraph, a voice key to record phonation (as used by Koepp-Baker (3)), a metal cup containing a movable metal frame covered by a rubber diaphragm which when attached to the jaw was activated by any jaw movement. Two Sumner pneumographs were strapped around the subject; one just below the armpits

and one at the level of the umbilicus, to record thoracic and abdominal breathing, and an electrical signal key was attached to the polygraph that one of the observers might signal onset and end of observed time. Two observers recorded direct observations on the check-list. There were ten subjects used, age range from seven years to 32 years, with a median age of 18 years. (With the exception of three ages the range of age was from 16 to 23 years). The subject was seated in a chair facing the two observers. He was instructed to read until told to stop. When he was told to continue he was to start reading on the word following the one on which he was stopped. The reading material was taken from magazines, newspapers, and books, and differed from subject to subject. At the onset of stuttering, observer A pressed the signal key and held it down until the subject had, to all observable indications, stopped stuttering. Upon release of the signal key the observer stopped the subject and the two observers checked the items observed. When the check had been completed the subject was allowed to continue. 50 such intervals were checked for each subject, making a total of 500 observed moments of stuttering. In the analysis, the items on the check-list were counted only if both observers agreed. (A complete list of the items on the check-list and the items recorded from the polygraph readings are to be found in the author's thesis, on file at the State University of Iowa.)

IV. Results

The data were analyzed to determine the frequency of occurrence of each phenomenon, agreement between direct and mechanically recorded observations, frequency of occurrence of paired items as shown by direct observation, frequency of occurrence of groups of three or more phenomena occurring within the same moment of stuttering.

V. Conclusions

The following general conclusions may be drawn from the results as analyzed:

1. There are 25 specific phenomena to be obesrved in the moments of stuttering. These phenomena occurred at least once in 500 moments of stuttering.

2. As shown by this study the types of phenomena occurring are: (1) those having to do specifically with the form of sound production (repetition, prolongation, etc.); (2) those having to do with respiration; (3) those having to do with action of the muscles of the articulators and/or the voice; (4) those having to do with general body position or change of position; (5) those having to do with extraneous movements of the facial muscles not used in the production of speech.

3. For all the subjects there were nine specific phenomena observed directly as occurring more than 25 per cent of the total moments of stuttering. These were: repetition, prolongation, silent interval, lip tremor-pucker-etc., audible sound, eye-blink-close-etc., holding breath, jaw tremor-movement, movement of the forehead and eyebrows.

4. There was a most frequently occurring phenomenon or phenomena for each subject. For one subject "holding breath" and "audible sound" each occurred 98 per cent of the time.

5. For four subjects the most frequently occurring phenomenon was "holding breath" which occurred 90 per cent or more of the total moments of stuttering for each subject.

6. For one subject "prolongation" occurred 100 per cent. For two other subjects the same item occurred 60 per cent or more.

7. For three subjects the phenomenon "audible sound" occurred 98 per cent of the time.

8. For one subject the most frequently occurring phenomenon was "silent interval" occurring 86 per cent of the time.

9. Considered individually two subjects had five specific phenomena occurring for each more than 25 per cent of the time; two subjects had seven; three subjects had eight; and three had 10 specific phenomena. The same items did not occur for any two subjects.

10. For each subject there was a most frequently occurring combination, or group of combinations, of specific phenomena recorded by direct observation.

11. When the frequently occurring specific phenomena were paired it was found that the number of such pairs occurring more than 25 per cent of the 50 moments of stuttering varied from 3 pairs occurring for one subject to 13 pairs occurring for one.

12. Two subjects each had 4 pairs occurring and these were the same pairs but varied in frequency of occurrence.

13. For all ten subjects there were one or two most frequently occurring pairs of phenomena, one pair each for seven subjects and two pairs each for three subjects.

14. In grouping the frequently occurring phenomena within a given moment of stuttering in units of three or more items ("patterns"), it was found that the occurrence ranged from no group for one subject to twelve groups for one.

15. The group of three items: "prolongation—silent interval—holding breath" was the most consistently recurring group of phenomena which occurred in a given moment of stuttering. This group occurred in six of the ten subjects' records with a minimum percentage of occurrence of 0.32 and a maximum percentage of occurrence of 0.74.

16. In this study there were 11 phenomena studied which could be recorded only by direct observation and five which could be recorded only by apparatus.

17. The direct observational method of recording had average percentages of agreement with the mechanical method varying from 0.64 to 0.92. The median of the averages would lie halfway between 0.83 for "holding breath" and 0.91 for "excessive and rapid exhalation."

18. The total number of phenomena obtained by direct observation showed a percentage of the total (recorded by both the observers and the mechanical device) which exceeded the percentage shown

by the mechanical device alone. This occurred in the records of seven of the ten subjects.

VI. Summary

In studying the specific phenomena to be observed during stuttering, it is found that of thirty items selected for investigation, 25 occurred one or more times in 500 observed moments of stuttering. In general, these 25 items dealt with respiration, phonation and articulation, extraneous movements of the facial muscles, and general movements or positions of the body. In 500 moments of stuttering, nine of the 25 phenomena occurred more than 25 per cent of the time. These nine specific phenomena did not include these having to do with the phenomena comprising the general type: bodily movements or positions.

Although more than one subject showed the same total number of phenomena occurring in more than 25 per cent of the time, the specific phenomena recurring in these totals was not identical for any two subjects.

The subjects showed individual differences in the median lengths of duration of the moment of stuttering.

Each subject showed a most consistently recurring combination of two specific phenomena occurring in the same moment of stuttering. Four of the ten subjects showed the same most consistently occurring pair of phenomena.

One subject showed no consistently occurring combination of three or more items occurring sequentially in the same moment of stuttering and occurring in 26 per cent or more of the total moments for that subject. One subject showed twelve such recurring patterns.

One group of the same three items occurred consistently for six of the ten subjects, the range of percentages of occurrence per subject was from 0.32 to 0.74.

In this study, the direct observational method was established to be reliable enough as compared to the mechanical records for adequate use by the clinician in studying the stuttering phenomena. It is not assured that experimentally the method of direct observation as used in this study could or should take the place of mechanical recordings. However, it is important to note that a higher percentage of the total number of phenomena per subject was observed by the direct observational method than by the mechanical device used.

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THE PEDAGOGICAL SIGNIFICANCE OF THE MOTO-KINAESTHETIC METHOD IN SPEECH THERAPY

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Man stands above all other living creatures mainly because he has the most effective tools for controlling his social environment. Of these tools, speaking, reading, and writing, the first stands apart as the master instrument. Socially, speech is at once the most important source of human stimulation and the most significant human response.

It is obvious that no two of us possess identical speech patterns. Each person possesses an accent of individuality. Yet the speech function is relatively highly standardized and socially valuable in direct proportion to its standardization. We learn to respond in a certain way to a certain speech pattern and to produce such and such a speech pattern to elicit such and such a response. If speech as a stimulus pattern is varied in some of its attributes (quality, intensity, duration, pitch, silent intervals) or in the manner these are interrelated so that it draws adverse attention to itself, the desired or expected response may be halting or entirely fail to appear. In a fundamental sense such a stimulus pattern is inadequate because it is a peculiar one to which other individuals have not learned specifically to respond. Inadequate adjustments follow, not only on the part of the auditor, but also on the part of the speaker himself. Exactly this situation exists in the case of the speech and voice defective.

Of all movements, those of speech expression present the greatest variety and complexity and comprise the largest number of diverse elements. In speech we find the most striking example of the highest type of integration of the entire organism. Here we find a single function, depending upon dissimilar structures each of which ordinarily subserves other and different functions, operating as a beautifully unified whole. The entire peripheral speech mechanism (lips, tongue, teeth, larynx, diaphragm, etc.) may be identified with biologically older and more fundamental vital functions which are seriously altered during speech. One is led to assume that this newer function of speech, in demanding exceedingly fine adjustments from the peripheral speech mechanism, places considerable strain upon it, the constituent parts of which were developed in relation to much simpler movements and coarser fundamental adjustments. There is not a

single muscle group which has been developed to serve speech exclusively.

In order to control efficiently the movements of parts common to many functions, the highest levels of integration necessarily alter some (e. g., breathing) and inhibit others (e. g., swallowing) of these functions. Although the same structures which subserve older and more established functions are co-ordinated to subserve the more recent and less well-established function of speech, the latter less-established function under normal speaking conditions dominates its dependencies. However, under certain unusual conditions speech-function dominance may be unseated in favor of some other-function dominance. In so-called normal speaking the entire peripheral speech mechanism functions as a unit, several individual functions having coalesced to form the whole. In certain forms of abnormal speaking there occurs a disintegration among the movements which is reflected not only in the individual parts but also in the whole of the mechanism.

Structurally it is difficult to envisage the peripheral speech mechanism as a single organ, but functionally it is practical to do so. In so viewing it we must realize that innervations from the various parts of the central nervous system must be highly integrated. This leads us to think that a part of the nervous system exerts a dynastic influence (dominance) other over parts to insure concerted but unequivocal action. When such influence is disturbed because of diseases, injuries, emotional shocks, emotional maladjustments, and faulty training, the pathophysiological subsoil of the essential speech dysfunctions obtains.

Both clinical and experimental evidence points toward the existence of a field of chief dominance in the central nervous system for speech and other related activities such as reading and writing. This field appears to be in the cerebral cortex. When we consider the great variety and complexity of movements resulting in speech, this power invested in the cerebrum assumes extreme significance. It is through just such superimposed and co-ordinating power that the movements of the individual parts of the speech mechanism are synthesized into the configuration known as normal speech. If it were not for this hierarchic control, the more fundamental natures of the subordinated powers could assert themselves to the consequent disconformity to and disconcertion of the speech act.

Speech is composed of a succession of synergic movements and alternating changes in various muscle groups each of which also performs in other more elemental acts. The complete speech act in its perfect form demands the mobilization in proper sequence of a series of complex procedures wherein the time relation is of fundamental importance. A lack of chronological exactitude will throw the whole performance into disorder. Too, there is the widest combination of stimuli, differing in origin, feeling, aim, and significance to function in speech. It is well to conceive of speech as a dominant kinetic

rhythm which may be interrupted by a wide variety of factors. An interruption would result in inconstancies in the progress of the forward-flowing process peculiar to vocal expression. When one envisages this activity as consisting of an orderly march of a highly integrated series of voluntary and automatic processes requiring perfect action of both cortical and subcortical mechanisms, it is not surprising that a relatively small percentage of individuals have disorders of speech. Rather it is surprising that so many have normal speech.

In a final sense speech may be considered as a total organismic stimulus-response complex.

In a short period of three years the child acquires a highly developed system of linguistic habits that he uses for the expression of his every need and desire. Such a remarkably rapid development of such an elaborate system of reaction patterns in such an immature organism is at once a wonder and a source of the keenest interest to the student of speech.

It is undoubtedly dependent upon the complicated interaction of two large factors, spontaneous experiment and practice on the infant's part and training on the part of parents and others. The two parts of this equation, spontaneous experimentation and training, depend for their effectiveness to a very large measure upon an intact and properly maturing speech mechanism (central nervous system and peripheral speech organs). If this mechanism is injured as it is in the motor defective infant, speech is slow in developing or fails to develop adequately, if at all. In any final sense then, speech development depends upon speech drive, proper environmental stimulation and a good mechanism for the expression of the interaction of the first two factors.

In this paper our emphasis will have to be limited to proper stimulation in the development of speech and in the correction of speech disorders. The primary source of stimulation is auditory and the great majority of children acquire relatively normal speech under its force. However, certain children free from hearing and motor defects, living in a world made up of spoken language either do not develop speech at all or develop it imperfectly. These children have perplexed educators for a long time. We have been forced to the conclusion that some other kind of stimulation had to be given. Phoneticians adhere to the method by which the child or adult is taught the correct positions and movements of the speech organs in sound formations. This is done mainly by instruction and demonstration. By the motokinaesthetic method the teacher actually guides by manual manipulation the parts of the speech apparatus into the necessary movements for the production of correct sound sequences. It reaches the child through the kineasthetic sense to give him a "feel" to the forming of sounds. Psychologically this is correct since the "feel" he will get is fully determined by the teacher and not left to chance in the child's own trial and error movements. If the

teacher has directed the child's muscles correctly, he will have received the correct kinaesthetic sensations and consequently will have established the basis for the correct speech pattern. Neurologically this is sound too, since the somesthetic gradient in the brain is very close functionally and anatomically to both the motor and the associative areas.

This method is particularly valuable used, as it always is, in conjunction with the auditory stimulation procedure. Here the child is receiving simultaneous stimulation of two supporting sense areas, a procedure which has been demonstrated to facilitate learning. Like all methods it has its limitations. It is obvious that the teacher cannot adequately bring all speech structures under her direct control. Some are just not accessible to direct manual manipulation. This handicap is overcome somewhat by the teacher making certain pressures and manipulations suggestive of the right movements in time and space on the part of the child. Admittedly much research remains to be done but the firm establishment of the method has opened up new approaches to the speechless and the speech disabled child.

COME TO THE CONVENTION

September 2–3–4, 1940

at Pennsylvania State College

THE INCIDENCE OF CLEFT PALATE IN HAWAII

FLORENCE M. HENDERSON
University of Hawaii

In a study of the incidence of cleft palate in glaciated and non-glaciated regions, Brown[1] conjectures that there may be a positive correlation between glaciation with its consequent thyroid deficiencies and the frequency of cleft palate in such regions. Relative to this conjecture certain data from the Territory of Hawaii may be of interest, because this is a non-glaciated region where the potable water is rich in iodine.

In September, 1936, the Board of Health of the Territory issued the following regulation relative to the reporting of visible congenital deformities of new-born children:

> "Within ten days after the date of the birth of any child born in the Territory of Hawaii with visible congenital deformities, the physician, midwife, or person acting as midwife, who shall be in attendance upon said birth, shall prepare and file with the registrar of the district in which said child is born a statement setting forth any deformity visible at such birth. . . .
>
> "The order of responsibility of reporting visible deformities shall be in accordance with the reporting of the child's birth, and the statement shall accompany the certificate of birth to the office of the local registrar. . . .
>
> "Any person held responsible under this regulation for its provisions, who shall violate the same, shall be subject, upon conviction, to a penalty of fifty dollars."

The statistics on the incidence of cleft palate in the Territory since the establishment of this regulation are given in Table I.[2] In it cases of cleft palate, harelip, and cleft palate and harelip are all classed as cleft palate just as they were in Brown's study.

In Table II the totals for the years reported by Hawaii are compared with the totals of the figures given by Brown for three years in Wisconsin and New Jersey, respectively.[3] From these figures it

[1]Brown, Janet. "Hypothyroidism as an Etiology of Cleft Palate," *The Journal of Speech Disorders*, IV, No. 3, pp. 247-253, September, 1939.

[2]These statistics were obtained through Dr. Richard K. C. Lee, Director of the Bureau of Crippled Children, Board of Health, Territory of Hawaii.

[3]Brown's numbers of cleft palate cases were incorrectly computed by placing the decimal point one place too far to the right. Thus, whereas she reported 10.9 cases per thousand live births, it should have been 1.09 cases. These figures have been corrected in the present study.

appears that there are 1.8 times as many cases of cleft palate per thousand live births in Hawaii, a non-glaciated area, as in Wisconsin, which is largely glaciated; and there are 4.1 times as many cases per thousand live births in Hawaii as there are in New Jersey.

It is not the purpose of this report either to substantiate or to refute the conjecture that the incidence of cleft palate may be positively correlated with hypothyroidism. The data are submitted merely for whatever significance they may have for future researchers. However, if cleft palate is positively correlated with hypothyroidism, perhaps the reverse should be true, and we should expect to find thyroid deficiency relatively prevalent in the Hawaiian Islands where cleft palate has a high incidence.

No statistics on the incidence of hypothyroidism in the Islands are available. It is noteworthy, however, that observations of

TABLE I

THE INCIDENCE OF CLEFT PALATE IN HAWAII

Fiscal Year	Live Births	Cleft Palate	No. Per Thousand
1938	8986	19	2.1
1939	9038	16	1.8
Total	18024	35	1.98

TABLE II

THE INCIDENCE OF CLEFT PALATE IN HAWAII, WISCONSIN, AND NEW JERSEY

Region	Live Births	Cleft Palate	No. per Thousand
Hawaii	18,024	35	1.98
Wisconsin	314,274	343	1.09
New Jersey	335,629	162	0.48

goiterous conditions—particularly simple goiter—are relatively rare in the medical records.

There is some evidence that low metabolic rates are frequently found in residents of the Islands, but to what extent these are due to hypothyroidism is unknown. Miller and Benedict,[4] in a study of 258 normal young men and women of both sexes and all races found that, in general, the metabolic rates fell below both the Harris-Benedict and AubDuBois prediction standards. Of the 258 subjects, 219 had rates below the Harris-Benedict standards, 233 had rates below the AubDuBois standards, and 238 had rates below one or

[4]Miller, Cary D. and Benedict, Frances G. "Basal Metabolism of Normal Young Men and Women of Various Races in Hawaii," *University of Hawaii Research Publications*, No. 15, pp. 1–56. 1937.

the other. The average deviation from the Harris-Benedict predictions for each group of men (including those with positive deviations) was less than —10%, the greatest deviation for any one group (the Caucasian) being —6.7%. The average deviation from the Harris-Benedict standards for the Chinese women was —15%. For each other group of women it was less than —10%.

Phillips,[5] in a study of the metabolism of eighty-eight patients who exhibited symptoms commonly associated with low metabolic rates—fatigue, headache, obesity, etc.—found that twelve had rates between 0 and —10% and thirty-five had rates lower than —10%. Of this latter group nine had rates lower than —20%. Of the twelve patients with rates between 0 and —10%, five were relieved of their symptoms by the administration of thyroid extract. Of the thirty-five with rates lower than —10, twenty-four were relieved by thyroid treatment.

Phillips does not presume to attribute these lowered metabolic rates to hypothyroidism, however. In fact, he makes it quite clear that there was no evidence of myxedema in any of these patients, and his sole interest was in raising the metabolic rates in order to secure relief from disturbing symptoms. He states that 40% to 50% of the body's heat production as measured by oxygen consumption is controlled by the thyroid gland. Since basal rates as low as —20% or lower are found in persons without demonstrable thyroid abnormality, he concludes that one must look to extra-thyroid physiological processes responsible for heat production independent of the thyroid gland for an explanation of depressed metabolism.[6]

Whether there is any connection between the low metabolic rates observed and the high incidence of cleft palate in Hawaii is highly doubtful. At least such connection cannot be assumed to exist without much more positive evidence than is available at present.

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[5]Phillips, Dr. Lyle G. "Symptoms Associated with Low Metabolic Rates," *Transactions of the Forty-eighth Annual Meeting of the Hawaii Territorial Medical Association*, pp. 151–161, May, 1938.

[6]*Ibid.*, p. 154.

Do not forget to attend the Convention at Pennsylvania State College September 2, 3 and 4, 1940, before your school starts— Why not make it a part of your vacation?

CONVENTION INFORMATION

(See pages 3 and 4 of cover for further information)

EXHIBITS

In co-operation with the psychological groups, the Committee on Local Arrangements is planning an extensive display of various types of equipment and books. Audiometers and hearing aids will be a featured portion of the exhibit. ASCA members are encouraged to exhibit unusual laboratory equipment as well as new devices and materials for speech training. Will those who are interested communicate with the Committee on Local Arrangements.

TRANSPORTATION

Highways: Entering from the east is U. S. highway 322, which connects at Lewistown with U. S. highway 22 from Harrisburg and points farther east. U. S. 322 is also the route from Cleveland and the northwest. It makes junction at Port Matilda with U. S. 220 from Altoona and routes from the west and southwest. Pennsylvania highway 45 passes through State College from the north and the south.

Railroads: Railroad stations for State College are on the Pennsylvania lines at Lewistown, 30 miles; Tyrone, 28 miles; and Bellefonte, 12 miles. Those coming from the east should get off at Lewistown; from the west at Tyrone; and from the north via Buffalo and Williamsport, get off at Bellefonte. Latest train and connecting bus schedules are as follows:

Railroad		Bus	Bus
Station	Arrives	Leaves	Arrives State College
Lewistown	12:30 P. M.	12:30 P. M.	1:30 P. M.
(from east)	7:24 P. M.	7:24 P. M.	8:25 P. M.
Tyrone	10:28 A. M.	11:56 A. M.	12:44 P. M.
(from west)	12:17 P. M.	1:12 P. M.	2:00 P. M.
	3:03 P. M.	5:41 P. M.	6:29 P. M.
Bellefonte (from north)	3:10 P. M.	3:15 P. M.	3:40 P. M.

Bus Lines: State College is served by the Greyhound interstate bus lines which provide local and express service from New York, Philadelphia, Harrisburg, Scranton, Pittsburgh, and Cleveland. Local bus companies operate between Lewistown and State College and between Bellefonte and State College.

Airways: The nearest transcontinental airway ports are Pittsburgh on the west and Harrisburgh on the southeast, which are on the TWA lines. A plane from the State College airport may be chartered to meet any planes at these or other airports.